REPORT
OF
THE STUDY GROUP
ON
ROAD SAFETY

GOVERNMENT OF INDIA
MINISTRY OF SHIPPING & TRANSPORT
(TRANSPORT WING)
JUNE 1972

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CHAPTER I

INTRODUCTION

1.1. Formation of Study Group

The ever increasing number of road accidents in the country in recent years, has posed the need for appropriate remedial measures being taken for promoting safety on the roads. In order that the problem might be examined in detail, and suitable remedial measures chalked out, the Government of India, in the Ministry of Shipping & Transport, by their Resolution No. 19-T(14)/68 dated 3rd June, 1969 (Annexure 1), appointed for this purpose a Study Group with headquarters in Bombay.

To begin with the composition of the Study Group was as follows :

1. Prof. K. T. Merchant,
   "Panch Sheel", C-Road,
   Marine Drive, Churchgate,
   Bombay. —Chairman

2. Shri Himatlal V. Gandhi,
   17, Horniman Circle,
   Bombay. —Member

3. Shri B. N. Lahiri,
   3, Ponnappa Road,
   Allahabad. —Member

4. Shri Indrakant Patel,
   Tractor House, Vishwamitri,
   Baroda. —Member

5. Shri Dilip K. Sen,
   M.A., L.L.B., (Cantab),
   Barrister-at-Law,
   Akash Deep,
   5, Lower Rawdon Street,
   Calcutta-20. —Member

6. Shri K. G. Subramanian, J.P.
Hon. Pres. Magistrate,
Secretary General,
Western India Automobile Association,
76, Vir Nariman Road,
Bombay-20 BR. —Honorary Secretary

1.2. Terms of Reference

The terms of reference of the Study Group were as follows:

(a) to enquire into the incidence of road accidents in urban areas and on highways in India, ascertain the causes of such accidents and suggest a suitable organisational set-up for collection and analysis of data/statistics relating to such road accidents ;

(b) to suggest measures for education of road users in road safety and better enforcement of traffic laws and regulations and recommend improvements in roads as may be necessary to ensure the maximum possible safety on roads ; and

(c) to suggest such other measures as may be germane to (a) and (b) above.

1.3. Inaugural Meeting

The first meeting of the Study Group was held in Delhi on the 27th September, 1969. It was inaugurated by Shri K. Raghuramaiya, who was then the Minister for Parliamentary Affairs, Shipping and Transport.

1.4. Changes in Composition

Following the resignation by Prof. K.T. Merchant, on personal grounds, of his office of Chairman of the Study Group on the 11th October, 1969, the Government of India, by their Notification dated the 29th December, 1969, appointed Shri Tulsidas Jadhav, M.P., as Chairman in the vacancy thus caused.

They also appointed Shri C.L.N. Iyengar, a Senior Engineer in the service of the Concrete Association of India, Bombay, and Dr. N.S. Srinivasan, Head of the Traffic & Transport Division, Central Road Research Institute, Delhi, as members of the Study Group, on the 12th November, 1969, and the 4th March, 1970, respectively. In addition, they appointed Shri Inder Jit

Murgai, a Section Officer in the Ministry of Shipping & Transport, as Deputy Secretary of the Study Group, on a part-time basis.

The final composition of the Study Group stood as follows:

1. Shri Tulsidas Jadhav,
195, Mitra Nagar Colony,
Sholapur. —Chairman

2. Shri Himatlal V. Gandhi,
17, Horniman Circle,
Bombay. —Member

3. Shri B.N. Lahiri,
3, Ponnappa Road,
Allahabad. —Member

4. Shri Indrakant Patel,
Tractor House, Vishwamitri,
Baroda. —Member

5. Shri Dilip K. Sen, M.A., LL.B. (Cantab)
Barrister-at-Law,
Akash Deep,
5, Lower Rawdon Street,
Calcutta. —Member

6. Dr. N.S. Srinivasan,
Head of the Traffic & Transport Division,
Central Road Research Institute,
Mathura Road,
New Delhi. —Member

7. Shri C.L.N. Iyengar,
Concrete Association of India,
Cement House, M. Karve Road,
Bombay—20. —Member

8. Shri K.G. Subramanian, J.P.
Hon. Pres. Magistrate,
Secretary General,
Western India Automobile Association,
76, Vir Nariman Road,
Churchgate, Bombay-20 —Honorary Secretary

9. Shri Inder Jit Murgai,
Section Officer,
Ministry of Shipping & Transport,
Transport Wing,
New Delhi. —Deputy Secretary.

1.5. Method of Enquiry

In order to elicit detailed information on different aspects of the road safety problem, two sets of questionnaires (Annexures 2 and 3) were drawn up, one meant for official agencies and the other for non-official institutions and bodies. At the first meeting of the Study Group held on the 27th September, 1969, the two questionnaires were finalised and copies thereof were then sent to the various Government Departments and Ministries as also to non-official organisations interested in road safety, like the Automobile Associations, the Chambers of Commerce, Safety First Bodies and Road Transport Organisations. Through the medium of these questionnaires valuable data as well as views and suggestions were collected which were found extremely useful.

To gather first hand information and hold on-the-spot discussions, the Study Group visited the headquarters of different State Governments and also one or more important cities in each State. The visits were on the basis of previously planned itineraries communicated to the State Governments concerned, by the Ministry of Shipping & Transport. During these tours there were usually two to three meetings, one of which was exclusively to meet representatives of the different Government and semi-Government Departments, another to meet non-officials (including representatives of non-official transport and other organisations and members of the public concerned with or interested in road safety), and a third, to meet newspaper reporters and other press representatives to explain to them the constitution and functions of the Study Group and to emphasise the role of the Press in educating the public.

Since the terms of reference of the Study Group also covered a study of accidents on the National and other highways, they took advantage of these visits to inspect accident prone spots, both on city roads as well as the highways (Photos 1 and 2). They were accompanied on such occasions by the local Police, the Transport and the PWD officials, who stopped at various points on the way to explain to them the danger spots. These officials sometimes also put up before the members of the Study Group the charts of accidents that they had maintained.

The meetings with officials and non-officials were arranged by the State Governments concerned. At the beginning of each meeting, the Chairman introduced the Group to those present and also briefed them about the terms of reference of the Study Group. Those present were then asked to make suggestions for the improvement of road safety. Thereafter, questions on road safety and related matters were put by members of the Study Group and the answers given were noted. Some written suggestions were also received. Names of the State authorities and non-officials and others who tendered oral evidence or sent their views in writing, are given respectively in Annexures 4 and 5.

The Study Group had 56 sittings in all, at different places. The States visited for taking oral evidence included Uttar Pradesh, Bihar, Haryana, Punjab, Jammu & Kashmir, Rajasthan, Gujarat, Maharashtra, Andhra Pradesh, Mysore, Tamil Nadu, Kerala, Delhi and West Bengal. The date and place of the meetings held with the officials and non-officials are given in Annexure 6.

1.6. Sub-Committees

1.6.1. Drafting Sub-Committees

At its meeting held in Delhi on the 1st December, 1970, the Study Group appointed a Sub-Committee composed as follows, for preparing a draft report :

1. Shri C.L.N. Iyenger,
   Concrete Association of India,
   Cement House,
   Bombay—20. —Member
2. Dr. N.S. Srinivasan,
   Head of the Traffic Division,
   Central Road Research Institute,
   Mathura Road,
   New Delhi. —Member
3. Shri K.G. Subramanian, J.P.
   Hon. Pres. Magistrate,
   Secretary General, W.I.A.A.,
   76, Vir Nariman Road,
   Bombay-20. Hon. Secretary

The Sub-Committee drew up and circulated a draft outline of the report which was approved by the Study Group at its meeting in Delhi on the 10th April, 1971, with a few additional points for incorporation. Subsequently, it prepared a draft text for the report on these lines and circulated it for detailed discussions at meetings of the Study Group.

1.6.2. Sub-Committee on Road Accidents in hill areas

In view of the numerous tragic road accidents that have occurred recently in the hill areas of the country, the Government of India constituted on the 31st March, 1971, (Annexure 7) a Sub-Committee of the Study Group on Road Safety, to consider specifically the problem of road accidents in the hill areas and make recommendations. The composition of the Sub-Committee was as follows:

1. Shri Tulsidas Jadhav,
   1/195, Mitranagar Colony,
   Sholapur. —Chairman
2. Dr. N.S. Srinivasan,
   Head of the Traffic & Transport Division,
   Central Road Research Institute,
   Mathura Road,
   New Delhi. —Member
3. Col. U.S. Anand,
   Chief Engineer, Project Deepak,
   C/o 56 APO,
   New Delhi. —Member
4. Shri R.P. Sikka,
   Superintending Engineer (Roads),
   Ministry of Shipping & Transport
   (Roads Wing), New Delhi. —Member
5. Shri C.L.N. Iyengar,
   Concrete Association of India,
   Cement House,
   Maharishi Karve Road,
   Bombay-20. Member
6. Shri K.G. Subramanian, J.P.
   Hon. Pres. Magistrate,
   Hon. Secretary of the Study Group on Road Safety,
   c/o W.I.A.A.,
   76, Vir Nariman Road,
   Churchgate, Bombay-20 —Hon. Secretary

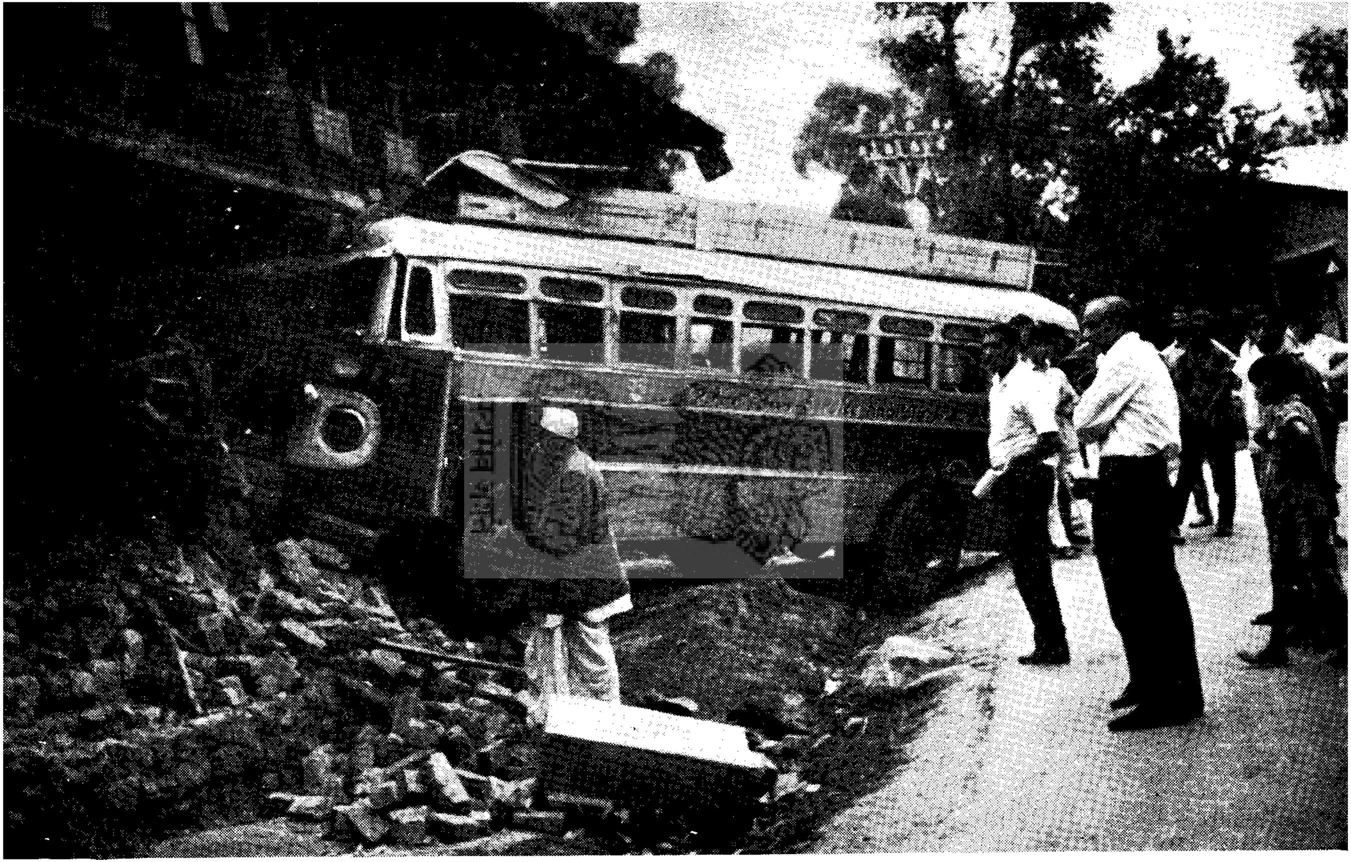

PHOTO 2—Inspection of an Accident

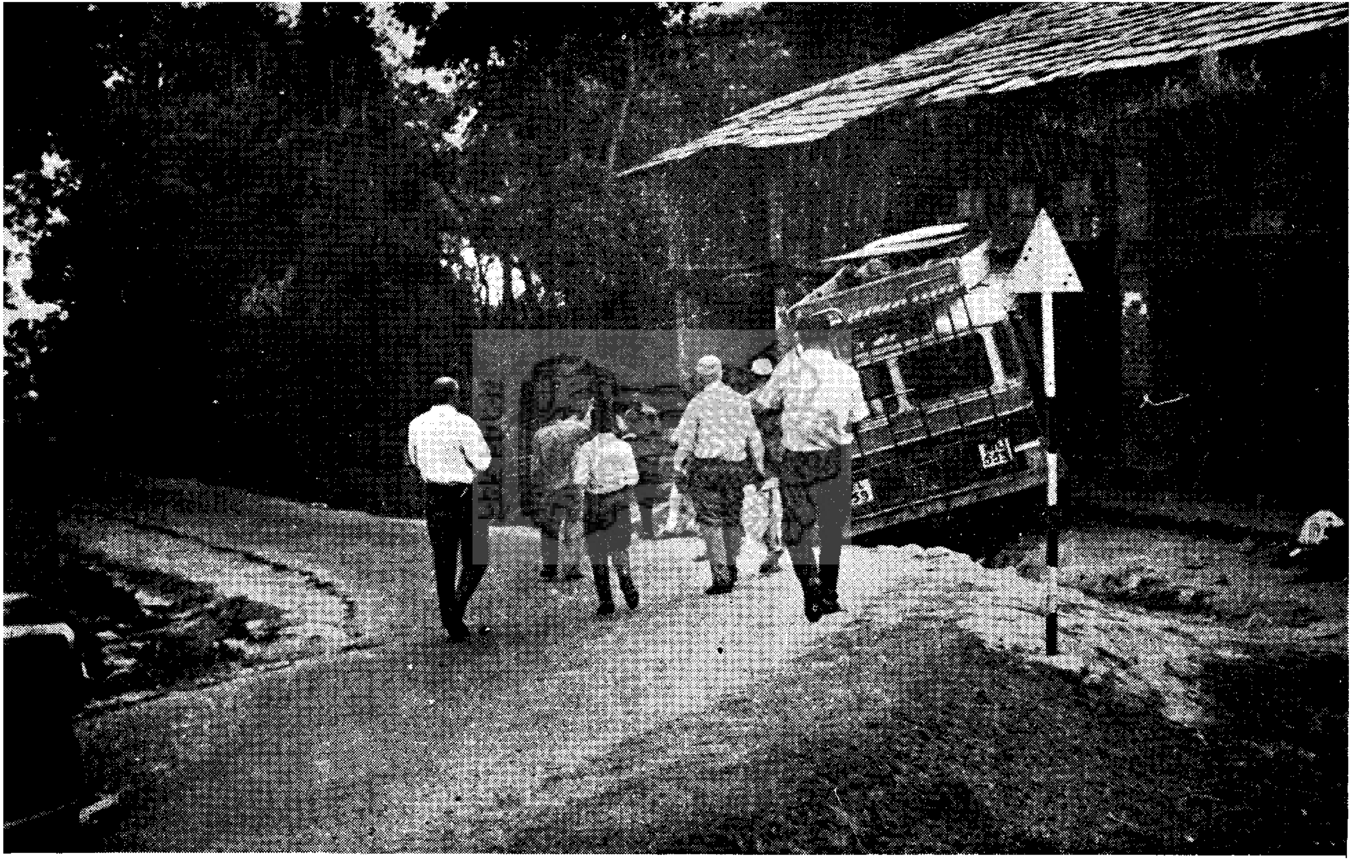

PHOTO 1—A Bad accident at a Dangerous Bend being Inspected

Like its main body, the Sub-Committee drew up a questionnaire relating to the hill roads and circulated it to the State Governments concerned (Annexure 8). A list of the State officials and non-officials, who sent their memoranda or answers to the questionnaire is given in Annexure 9. The Sub-Committee visited the States of Himachal Pradesh, Uttar Pradesh, Tamil Nadu and Mysore and discussed the problem with their officials and representatives of their non-official Transport organisations.

1.7. Term of the Study Group

The Study Group had hoped to conclude its work by the end of June 1971, but the intervention of the mid-term poll upset its programme of visits for recording oral evidence. Further, Government's request to the Study Group in March, 1971 to make a special study of road accidents in the hill areas, followed by the floods of that year (which disrupted communications in many States) and, later on, the Indo Pakistan War and the General Elections, necessitated extension of its term, in the first instance, upto the 31st December, 1971, and finally, upto the 30th June, 1972.

1.8. Acknowledgements

We wish to take this opportunity to place on record our warm acknowledgement of the full measure of cooperation we received from all State Governments, Union Administrations, the Border Roads Organization, Associations of Road Transport Operators, the Western India Automobile Association and individual witnesses. Without their cooperation, it would not have been possible for us to complete our task. We would, particularly, thank the State Governments for the excellent arrangements made by them during our meetings and for the inspection facilities provided to the members of the Study Group. We would also like to place on record our appreciation of the hard work done by the Drafting Committee in preparing the Report. We would also like to express our gratitude to Sarvashri K. G. Subramanian, Honorary Secretary and Inder Jit Murgai, Honorary Deputy Secretary of the Group for the thorough and systematic way in which they analysed the evidence tendered before us and the invaluable help they gave to the Study Group. We would also acknowledge the assistance that we readily received from the officials of the Ministry of Shipping & Transport in our work, particularly, Sarvashri K.C. Joshi, Deputy Secretary and N.A.A. Narayanan, Under Secretary, in supplying the information required by us and the suggestions made by them on matters covered by our enquiries. Our thanks are also due to the officials of the Central Road Research Institute, particularly, Miss D.V. Hingorani and Shri B.M. Sharma, for the valuable assistance rendered by them in getting the statistical tables and other analysis made for the benefit of the Study Group. We shall be failing in our duty if we also do not take this opportunity to express our appreciation of the exceedingly good work done by Shri S. L. Narang, P.A. to Chairman, who bore the brunt of the stenographic work and also rendered other assistance to the Study Group. Before concluding, the Members would like to express their sense of deep gratitude to the Chairman, Shri Tulsidas S. Jadhav, for the courtesy and patience shown by him and for his able guidance in our deliberations.

CHAPTER 2

A REVIEW OF ROAD SAFETY PROBLEM

2.1. A GENERAL REVIEW OF THE HIGHWAY SAFETY PROBLEM IN THE WORLD.

2.1.1. Alarming Problem

The traffic accident has come to be considered as the third deadliest killer. It is surpassed in this sorrowful competition only by heart disease and cancer. Traffic accidents are problems the motor age has created and we are slower to adapt ourselves to the hazards of the motor vehicles than we have been to the industrial revolution. Moreover, growth in the number as well as speed of motor vehicles has far out-paced improvements to the road and other traffic facilities.

The heavy toll of deaths, injuries and property damage in motor vehicle accidents on streets and highways, is an international problem of increasing importance. In the whole world, about 200,000 persons were killed and 7.5 million injured in the year 1968. In Great Britain, the economic cost of road accidents has been estimated at £300 million (*i.e.* Rs. 5400 million) the same year. The total cost of road accidents in European countries amounts to about one per cent of their national revenues. Although, no detailed study has been conducted in India, it is estimated that the economic loss arising from road accidents in this country amounts to about Rs. 200 million every year.

2.1.2. Fatality Rates

Table 1 shows the number of road accidents, the number of persons killed and injured and traffic death rate per 1000 motor vehicles, per population of 100,000 and per 100 kilometres of road in a few European countries, the U.S.A., Singapore and India in the year 1968. This table reveals that in 1968, the number of road accidents was the highest in the U.S.A. with a total of 1.5 million, followed by West Germany, with 339,704. The number of road accidents in Switzerland was on the lower side with 25,690. Table 1 also shows that the highest number of persons

TABLE 1

Road Accidents in some countries in the year 1968

Country	Total Number of accidents	Number of persons			Number of persons killed		
		Killed	Injured	Total	Per 100 Kilometres of road	Per 1000 Motor vehicles	Per 100,000 Population
1	2	3	4	5	6	7	8
Austria	48,963	2,157	66,335	68,492	6	1	30
France*	2,15,470	13,585	3,01,356	3,14,941	1	1	27
West Germany . . .	3,39,704	16,636	4,68,718	4,85,354	4	1	29
Great Britain . . .	2,64,200	6,810	3,42,398	3,49,208	2	1	13
India	1,02,230	10,654	58,565	69,219	1	8	2
Italy	1,78,173	9,809	2,34,033	2,43,842	3	1	19
Netherlands . .	54,240	2,907	62,098	65,005	3	1	23
Switzerland . . .	25,690	1,405	32,194	33,599	2	1	23
U.S.A.	15,00,000	55,500	23,00,000	23,55,500	1	1	28
Yugoslavia . . .	28,298	2,703	38,724	41,427	3	4	13
Singapore* . . .	36,171	242	10,110	10,352	Not available	1	13

*The figures relate to 1967.

killed was in the U.S.A., with 55,500, followed by West Germany, with 16,636. On the lower side, the number of persons killed was in Singapore, with 242 and, next, in Switzerland, with 1405. Similarly, among the number of persons injured, the U.S.A topped the list with 2.3 million, followed by West Germany with 468,718, while on the lower side, the corresponding figures were 10,110 for Singapore and 32,194 for Switzerland.

2.1.2.1. Fatality rate per 1000 motor Vehicles

Although, the number of persons killed and injured is not high in India, as compared to the figures in foreign countries, yet, if the fatality rates per 1000 motor vehicles is reckoned, it presents a gloomy picture. In the year 1968, for instance, the fatality rate here *i.e.*, the number of persons killed per 1000 motor vehicles, was the highest, being as high as 8 as compared to one only in most European countries, the U.S.A. and Singapore. If the present trend in the increase of motor vehicles continues, the traffic accident problem here is sure to become still more serious and India will face the same difficulty as the other highly motorised countries are doing.

2.1.2.2. Fatality rate per one hundred thousand population

Table 1 shows that Austria had the highest fatality rate of 30 per hundred thousand population, followed by 29 of West Germany and 28 of the U.S.A., whereas it was only 2 for India.

2.1.2.3. Fatality rate per 100 Kilometers of Road

The fatality rate per 100 kilometers of road (Table 1) was the highest in Austria, with 6, and the lowest in France, the U.S.A. and India with one.

2.1.3. Category of persons Killed and Injured

Casualties were categorised according to the number of persons killed and injured in a few European countries and in India in 1967, and the results are given in Table 2. The percentage of pedestrians killed out of the total number of persons killed in road accidents was the highest in Great Britain with 40.5, followed by India with 38.7 and Yugoslavia with 36.8. France with 23 and Italy with 25.2 had fairly low figures. The highest percentage of pedestrians injured was in India with 36.

Regarding occupants of motor vehicles involved in accidents the percentages of persons killed and injured were more than 50

TABLE 2

Category of persons killed and injured in road accidents in a few European Countries and in India in 1967.

Country	Nature of accident	Pedestrians		Cyclists		Occupants of motor vehicles*		Others		Total	
		No.	%	No.	%	No.	%	No.	%	No.	%
1	2	3	4	5	6	7	8	9	10	11	12
Austria	Killed	689	32.4	172	8.1	1,241	58.4	23	1.1	2,125	100.0
	Injured	10,115	15.1	5,265	7.9	50,814	75.9	794	1.1	66,988	100.0
France	Killed	3,120	23.0	838	6.2	9,607	70.7	20	0.1	13,585	100.0
	Injured	39,297	13.0	14,999	5.0	2,46,770	81.9	290	0.1	3,01,356	100.0
West Germany	Killed	5,822	34.1	1,797	10.5	9,367	54.8	98	0.6	17,084	100.0
	Injured	70,809	15.3	44,520	9.6	3,43,946	74.4	2,773	0.7	4,62,048	100.0
Great Britain	Killed	2,964	40.5	463	6.3	3,822	52.2	70	1.0	73,19	100.0
	Injured	81,315	22.5	27,373	7.5	2,53,971	70.0	..	..	3,62,659	100.0
Italy	Killed	2,361	25.2	1,110	11.8	5,773	61.5	137	1.5	9,381	100.0
	Injured	37,908	17.1	15,028	6.8	1,66,711	75.2	1,954	0.9	2,21,601	100.0
India	Killed	3,778	38.7	640	6.6	3,963	40.6	1,370	14.1	9,751	100.0
	Injured	18,548	36.0	4,488	8.7	23,099	44.8	5,372	10.5	51,507	100.0
Switzerland	Killed	463	32.5	99	6.9	849	59.6	13	1.0	1,424	100.0
	Injured	6,049	19.2	2,532	8.0	22,702	71.9	277	0.9	31,560	100.0
Yugoslavia	Killed	807	36.8	231	10.5	1,106	50.4	51	2.3	2,195	100.0
	Injured	7,733	22.9	2,778	8.2	22,437	66.5	803	2.4	33,751	100.0

*Includes motor cycles.

in European countries and in some of them even as high as 75-80. The highest percentage of occupants of motor vehicles killed was in France with 70.7 as against 40.6 in India Similarly, the percentage of persons injured was the highest in France with 81.9 as compared to 44.8 in India. These high percentages of persons killed or injured in France may be attributed to the larger number of motor vehicles per 1000 persons in that country, which was 243 as against 190 in the U.K., 182 in West Germany and 123 in Italy.

2.1.4. Relationship between road fatalities, registered number of motor vehicles and population.

From a critical study of the traffic deaths, the number of registered motor vehicles and the population figures of different countries over a period of years, the following relationship* (Figure 1) has been established :

$$\frac{D}{V} = 0.003 \times \left(\frac{P}{V}\right)^{\frac{2}{3}}$$

where D = Number of traffic deaths.

V = Number of registered motor vehicles

and P = Population.

Applying the above equation, it is estimated that as against 10,654 traffic deaths in India in the year 1968, there will be as many as 43,144 in 1981 when the population and the number of motor vehicles are estimated to reach 670,000,000 and 6,625,400 respectively. Thus the number of traffic deaths is likely to be more than fourfold at the end of the period 1968-81.

2.2. Highway Safety Problem with special reference to India—A Factual record of the accidents on highways in rural and urban areas.

2.2.1. Accident problem in India.

In India, there has been a rapid increase in the number o motor vehicles in the last decade, and a corresponding increase in the number of accidents. The fact that our roads were not planned for the volume and speed of traffic that now prevail,

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† Patric A. Hall, "International Comparison of Traffic Accidents", Traffic Engineering, November 1970, pp. 20-24.

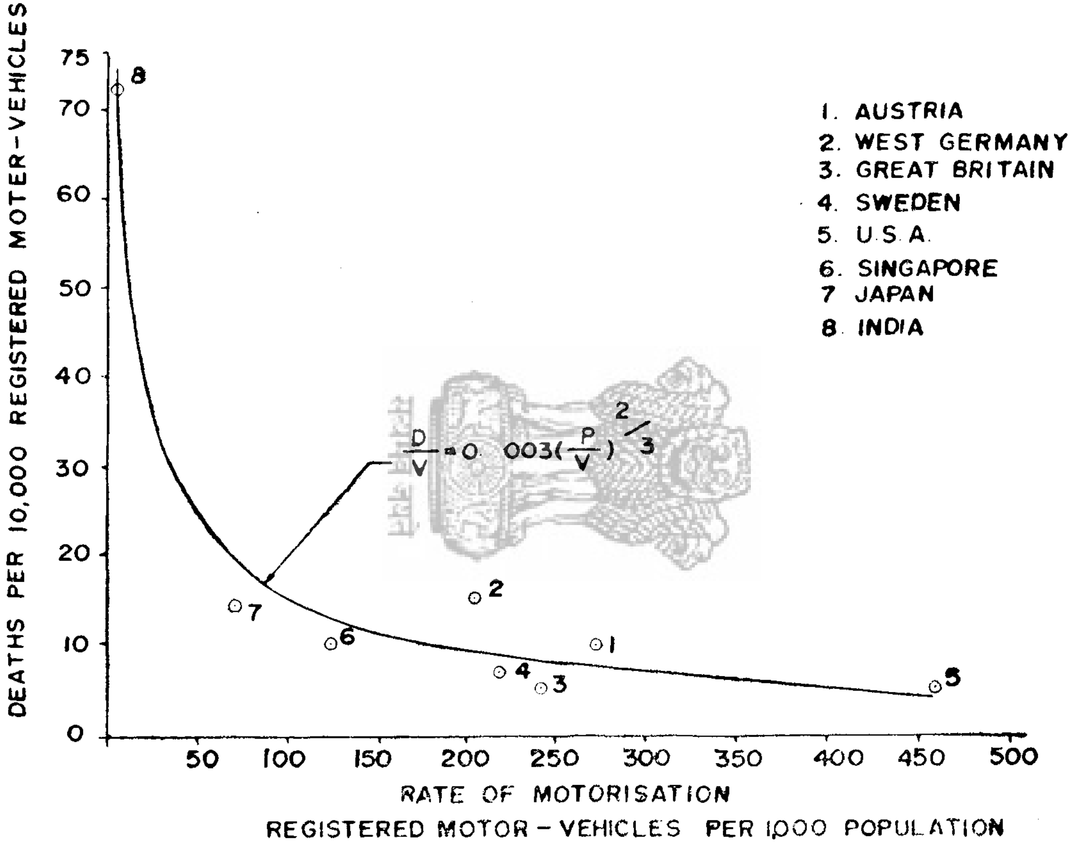

FIGURE. I RELATIONSHIP BETWEEN NUMBER OF DEATHS PER 10,000 REGD. MOTOR VEHICLES & NUMBER OF MOTOR VEHICLES PER 1000 POPULATION

further complicates the problem. To make matters worse, our roads have to carry a greatly mixed traffic, ranging from a powerful fast moving automobile to a cumbersome snail-paced bullock cart, often resulting in a state of complete chaos. The impact of these and other factors on the trend in road accidents is discussed in the following paragraphs.

2.2.1.1. **Trend in Road Accidents and Casualties in India.**

Table 3 gives the number of motor vehicles, of road accidents and of persons killed and injured in India, during the years 1960—1968. It shows that there was an increase of about 84 per cent in road accidents, as against an increase of 141 per cent in the number of motor vehicles in these 8 years, amounting to an average annual increase of about 11 per cent and 18 per cent respectively. The average annual increase in the number of persons killed and injured was about 14 and 9 per cent respectively.

TABLE 3

Trend in motor vehicles road accidents and casualties in India during the years 1960—1968.

Year	Motor Vehicles	Total road accidents	Number of persons		
			Killed	Injured	Total
1	2	3	4	5	6
1960	6,04,902	55,478	5,106	33,731	38,837
1961	675,221	59,770	5,547	36,230	41,777
1962	7,39,772	62,891	6,269	39,184	45,453
1963	8,47,428	65,660	6,820	36,111*	42,931
1964	9,05,964	68,168	7,207	42,730	49,937
1965	10,06,447	71,897	8,410	45,478	53,888
1966	11,90,412	74,340	8,702	48,651	57,353
1967	13,33,033	1,00,131	9,734	51,377	61,111
1968	14,58,583	1,02,230	10,654	58,565	69,219
Annual average increase (in per cent)	17.5	10.5	13.6	9.2	

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* Excluding Calcutta region.

Table 4 shows the latest available information of the number of motor vehicle accidents, persons killed and persons injured in various States in India.

TABLE 4

Number of motor-vehicle accidents and number of persons killed and injured in motor-vehicle accidents in India in 1969.

State/Union Territory	Number of Motor vehicle accidents	Number of persons Killed	Number of persons Injured	Total number of persons killed and injured
1	2	3	4	5
Andhra Pradesh .	3,207	1,050	2,398	3,448
Assam* . . .	979	311	1,369	1,680
Bihar . . .	3,687	831	3,014	3,845
Gujarat* . . .	3,343	604	2,854	3,458
Jammu & Kashmir* .	202	82	182	264
Kerala . . .	4,156	528	4,123	4,651
Madhya Pradesh@ .	3,030	629	2,257	2,886
Maharashtra* . .	34,283	1,680	14,587	16,267
Mysore* . .	4,141	1,009	4,466	5,475
Orissa . . .	2,143	246	1,897	2,143
Punjab* . . .	534	192	275	467
Haryana* . .	476	184	384	568
Rajasthan* . .	999	353	695	1,048
Tamil Nadu . .	11,696	1,283	9,682	10,965
Uttar Pradesh+ .	1,913	518	1,413	1,931
West Bengal* . .	21,177	938	6,902	7,840
Andaman & Nicobar Islands . . .	54	5	55	60
Delhi . . .	8,014	429	3,404	3,833
Goa, Daman & Diu .	665	14	307	321
Himachal Pradesh .	231	127	437	564
Manipur . . .	116	16	150	166
Pondicherry . .	167	18	159	177
Tripura . . .	172	13	309	322
Nagaland . . .	36	4	32	36
Chandigarh . .	113	6	54	60
Dadra & Nagar Haveli	12	2	2	4

*Year 1968. @1965. +1964.

Maharashtra with a total of 34,283 accidents topped the list, followed by West Bengal with 21,177. The highest number of persons killed and injured was also in Maharashtra State with 1680 and 14,587 respectively, followed by Tamil Nadu with 1,283 killed and 9.682 injured.

2.2.1.2. **Classification of persons killed and injured in India.**

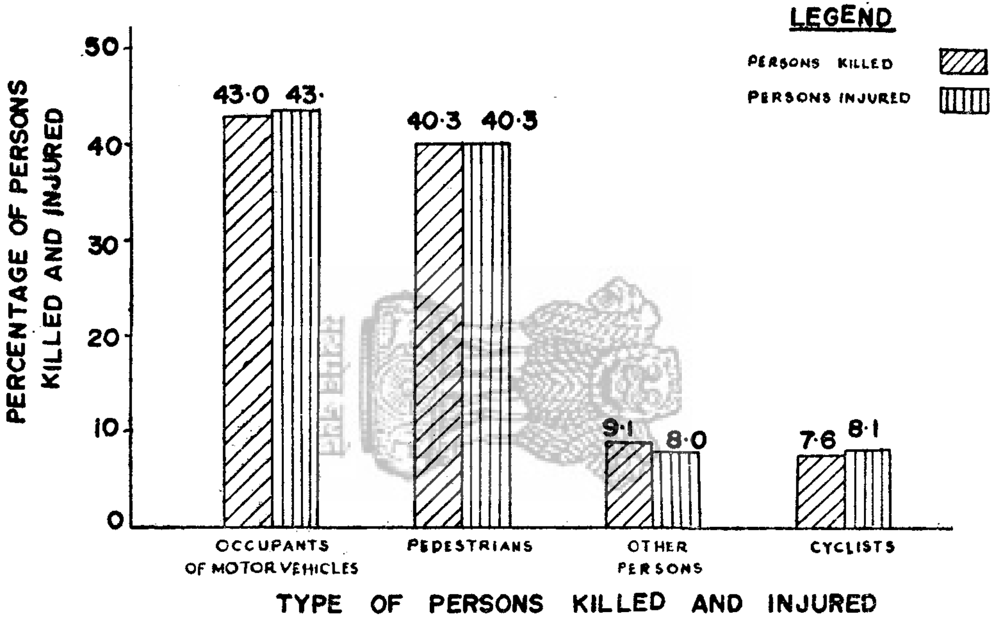
The distribution of persons killed and injured in India in 1968, according to three main groups, *viz.*, pedestrians, cyclists and occupants of motor vehicles, is given in Table 5 and Figure 2. It shows that occupants of motor vehicle accounted for the highest percentage of persons killed and injured with an incidence of 43.0 and 43.6. respectively. Next in order were pedestrians with 40.3 per cent killed and the same injured.

A classification of accidents according to the type of motor vehicles involved and also the type of motor vehicles registered in India in 1968 is given in Table 6 and Figure 3. It reveals that cars were involved in 26.2 per cent of the total number of accidents, which was the highest figure according to the type of vehicle. The next in order was goods vehicles with a percentage of 24.8. With regard to the rate of accidents per 10,000 motor vehicles, taxis topped the list, followed by the other public service vehicles, the figures being 3,251 and 1,666 respectively. In the case of motor-cycles and auto-rickshaws the figure stood at 210.

TABLE 5

Type of persons killed and injured in road accidents in India in 1968.

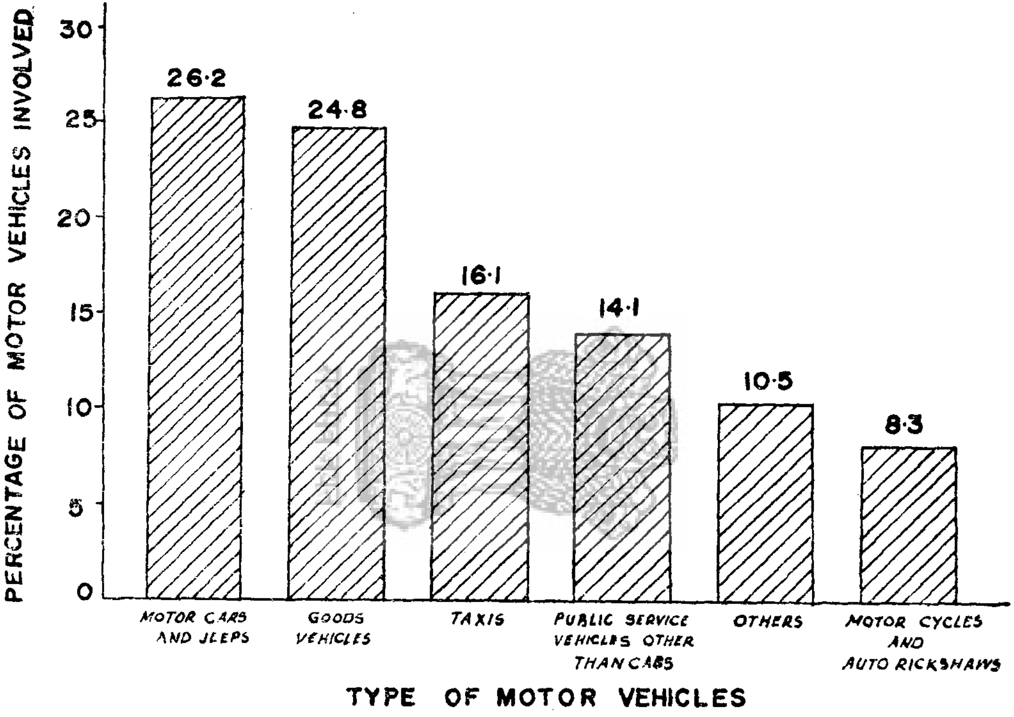
Type of persons	Persons			
	Killed		Injured	
	Number	Per cent	Number	Per cent
Pedestrians . .	4,290	40.3	23,612	40.3
Cyclists . . .	809	7.6	4,718	8.1
Occupants of motor vehicles . .	4,583	43.0	25,552	43.6
Other persons . .	972	9.1	4,683	8.0
TOTAL .	10,654	100.0	58,565	100.0



TYPE OF PERSONS KILLED AND INJURED IN ROAD ACCIDENTS IN INDIA IN THE YEAR 1967

FIGURE – 2

C.R.R.I.



TYPE OF MOTOR VEHICLES INVOLVED IN ROAD ACCIDENTS IN INDIA IN THE YEAR 1967

FIGURE – 3

C.R.R.I.

TABLE 6

Motor vehicle accidents and motor vehicles registered classified according to the type of motor-vehicles in India

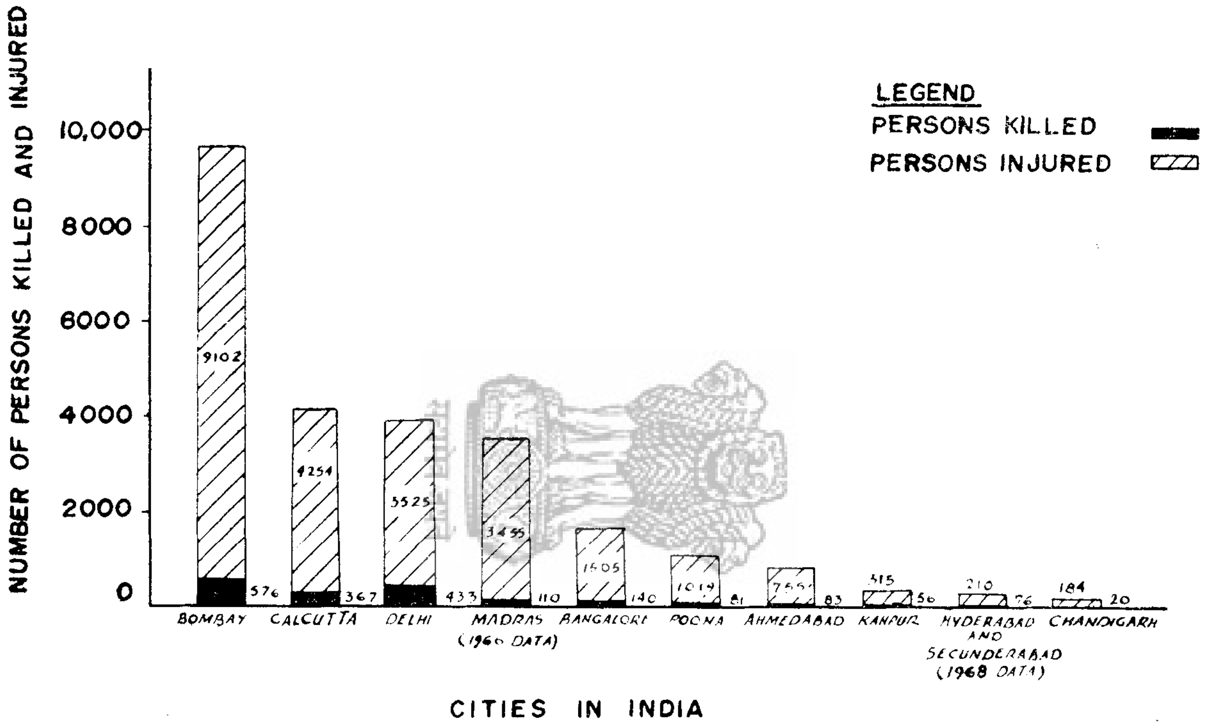
Type of motor vehicles	Motor vehicle accidents		Motor vehicles registered		Accidents per 10000 vehicles (Col. 2x 10000) + Col. 4
	Number	Per cent	Number	Per cent	
1	2	3	4	5	6
Motor cycles and autorickshaws .	8,467	8.3	4,02,646	27.6	210.3
Motor cars and jeeps	26,827	26.2	5,09,489	35.0	526.5
Taxis . . .	16,414	16.1	50,497	3.5	3,250.5
Buses . . .	14,424	14.1	86,570	5.9	1,666.2
Goods vehicles .	25,397	24.8	3,06,802	21.0	827.8
Others . . .	10,701	10.5	1,02,579	7.0	1,043.2
TOTAL . . .	1,02,230	100.0	14,58,583	100.0	

2.2.2. ROAD ACCIDENTS IN BIG CITIES IN INDIA

2.2.2.1. Severity of Accidents

With a rapid increase in industrialisation and a high degree of urbanisation, there has been an increasing trend in the population and the number of motor vehicles in big cities in India, resulting in an alarming increase in road accidents. Table 7 shows the total number of traffic accidents, and the number of persons killed and injured in various big cities in India in the year 1969. According to it, the highest number of accidents occurred in Bombay with 24,812, followed by Calcutta with 13,874. The number of accidents was low in Chandigarh with only 197.

Figure 4 shows the number of persons killed and injured in a few cities in India. The number of persons killed was the highest, again, in Bombay with 576, followed by Delhi, with 433. Regarding the number of persons injured, Bombay again topped the list with 9,102, followed by Calcutta with 4,254.



NUMBER OF PERSONS KILLED AND INJURED IN A FEW BIG CITIES

IN INDIA IN THE YEAR 1969

FIGURE—4

C.R.R.I.

TABLE 7

Road accidents and number of persons killed and injured in a few cities in India in 1969

City	Total accidents	Number of persons		Total
		Killed	Injured	
1	2	3	4	5
Bombay	24.812	576	9,102	9,678
Delhi	8,164	433	3,525	3,958
Calcutta	13,874	367	4,254	4,621
Madras	7,361	110	3,455	3,565
Bangalore . . .	1,646	140	1,505	1,645
Poona . . .	1,889	81	1,019	1,100
Ahmedabad . . .	811	83	755	838
Kanpur . . .	403	56	315	371
Hyderabad and Secunderabad@	630	76	210	286
Chandigarh . . .	197	20	184	204

@Figures relate to the year 1968.

The average number of accidents per day was 68 in Bombay, 38 in Calcutta and 22 in Delhi, while the number of fatal accidents per day averaged 1.58 in Bombay, 1.19 in Delhi and 1.00 in Culcutta, respectively.

2.2.2.2. Type of Persons Killed and injured in big cities in India.

Table 8 showing the classification of accidents according to the type of persons killed and injured in a few cities in India in 1969, reveals that pedestrians were the worst sufferers. The percentage of pedestrians killed was the highest in Bombay, with 85.2, followed by Bangalore, with 60.7. In Ahmedabad and in the twin cities of Hyderabad and Secunderabad the rate was much lower. The highest percentage of pedestrians injured was, again, in Bombay with 72.0, while in Ahmedabad it was only 26.5.

The proportion of cyclists in relation to others killed and injured in accidents in cities in India was the highest in Poona with 33.3 and 26.7 per cent respectively, while in the case of motor cyclists killed, Delhi had the highest percentage with 11.3, followed by Bangalore, with 7.8. In the case of motor

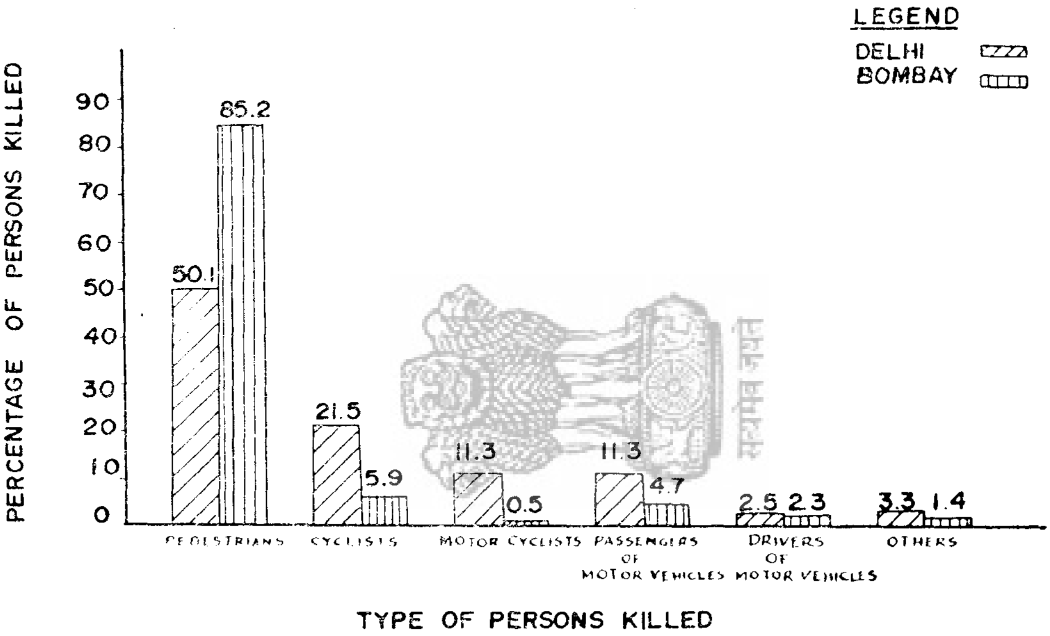
TABLE 8

Typeof persons killed and injured in a few cities in India in the year 1969

City	Pedestrians				Cyclists				Motor-cyclists				Drivers of motor vehicles			
	Killed		Injured		Killed		Injured		Killed		Injured		Killed		Injured	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Bombay .	491	85.2	6,552	72.0	34	5.9	611	6.7	3	.5	155	1.7	13	2.3	709	7.8
Delhi .	217	50.1	1,659	47.1	93	21.5	770	21.8	49	11.3	435	12.3	11	2.5	98	2.8
Bangalore .	85	60.7	595	39.5	22	15.7	260	17.3	11	7.8	218	14.5	3	2.1	169	11.2
Poona .	39	48.1	417	40.9	27	33.3	272	26.7	1	1.2	36	3.5	*	..	*	..
Ahmedabad .	37	44.6	200	26.5	24	28.9	148	19.6	5	6.0	38	5.0	2	2.4	99	13.1
Hyderabad & Secunderabad	34	44.7	96	45.7	22	28.9	41	19.5	..	..	5	2.4	13	17.1	37	17.6

City	Passengers of motor vehicles				Others				Total			
	Killed		Injured		Killed		Injured		Killed		Injured	
	No.	%	No.	%	No.	%	No.	%	No.	%	No.	%
	18	19	20	21	22	23	24	25	26	27	28	29
Bombay .	27	4.7	800	8.8	8	1.4	275	3.0	576	100.0	9,102	100.0
Delhi .	49	11.3	427	12.1	14	3.3	136	3.9	433	100.0	3,525	100.0
Bangalore .	*	..	*	..	19	13.7	263	17.5	140	100.0	1,505	100.0
Poona .	*	..	*	..	14	17.4	294	28.9	81	100.0	1,019	100.0
Ahmedabad .	12	14.5	249	33.0	3	3.6	21	2.8	83	100.0	755	100.0
Hyderabad & Secunderabad	6	7.9	29	13.8	1	1.4	2	1.0	76	100.0	210	100.0

*Data not available separately for this head, but included in the Column "Others".



TYPE OF PERSONS KILLED IN BOMBAY AND DELHI

IN THE YEAR 1969

FIGURE – 5

C.R.R.I.

cyclists injured, Bangalore had the highest percentage with 14.5, followed by Delhi, with 12.3.

In the case of drivers of motor vehicles killed and injured, the twin cities of Hyderabad and Secunderabad had the highest percentages, the figures being 17.1 and 17.6 respectively. Figure 5 shows that the percentage of drivers killed in Delhi was 2.5. As regards the occupants of motor vehicles, the highest percentages of those killed and injured were in Ahmedabad, the figures being 14.5 and 33.0 respectively.

Table 9 shows that out of every 497 motor cars and jeeps in Bombay and 699 such vehicles in Delhi, one was involved in fatal accidents in each of these cities. Also, one out of every 5.90 motor cars and jeeps in Bombay and one out of every 18 such vehicles in Delhi, were involved in one or other type of accident.

As regards trucks, the corresponding figures were 61 for Bombay and 62 for Delhi in the case of fatal accidents and 3 and 7 respectively in the case of total accidents.

Apropos taxi cabs, one out of every 173 in Bombay and one out of every 163 in Delhi were involved in fatal accidents.

As regards all types of motor vehicles, one out of every 247 in Bombay and one out of every 293 in Delhi were involved in fatal accidents while, in the case of accidents taken as a whole, one out of 5 motor vehicles in Bombay and 15 in Delhi were involved.

2.2.2.3. Relationship between Traffic Fatalities, registered number of Motor Vehicles and Population

From a study* of the trend in traffic deaths, the number of registered motor vehicles and the population, the following equation was established to predict the likely number of deaths in road accidents in Delhi :

$$\text{Log } D = 4.3501 + 0.1510 \log X + 1.8646 \log Y$$

where D = number of traffic deaths in a year;

X = number of registered motor vehicles in thousands; and

Y = Population in thousands.

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* N.S. Srinivasan, et. al., "A Study of Accident Prone Spots in Delhi" Journal of the Indian Roads Congress, Volume XXXVIII-3.

TABLE 9

Number of different types of motor-vehicles registered and the rate of different types of motor-vehicles per fatal and per total accidents in Bombay and Delhi in the year 1969.

Type of motor vehicles	Bombay					Delhi				
	Motor vehicles registered	Accidents		Vehicles per fatal accident	Vehicles per total accident	Motor vehicles registered	Accidents		Vehicles per fatal accident	Vehicles per total accident
		Fatal*	Total*				Fatal*	Total*		
1	2	3	4	5	6	7	8	9	10	11
Motor-cycles	20,293	24	1,437	845.54	14.12	58,693	32	1,342	1,834.16	43.73
Auto-rickshaws	7	..	2	..	3.50	8,214	31	918	265.0	8.94
Motor cars and Jeeps	76,501	154	12,958	496.75	5.90	40,527	58	2,286	698.74	17.77
Taxi cabs	13,999	81	4,760	172.83	2.94	3,419	21	611	162.71	5.60
Trucks	10,649	176	3,498	60.51	3.04	10,032	162	1,399	61.92	7.17
Buses	14,224	88	1,416	161.63	10.04	2,553	95	1,259	26.87	2.03
Other vehicles	294	27	741	10.89	0.40	..	23	349	..	..
	1,35,967	550	24,812	247.21	5.48	1,23,538	422	8,164	292.74	15.13

*Include only motor-vehicles, primarily involved in accidents.

Applying the above equation, it is estimated that there will be 1195 traffic deaths in Delhi in 1981, as against 167 in 1961. This shows that with an increase in the number of motor vehicles and the population in cities, the road safety problem is bound to become very acute, unless effective and timely steps are taken to forestall it.

2.3 Current Trends in the Measures and Programme for Improving road safety.

As compared to the small number of motor vehicle users in this country relative to other developed countries, the serious accident picture as given by the preceding analysis is clearly indicative that thus far the problem of highway safety in India has not been approached with the same urgency and earnestness as in the more affluent countries. This probably arises from the fact that our limited national resources have commanded higher priorities for economic development, as compared to social requirements. However, the anxiety of the Government of India for improving road safety is reflected in the steps they have taken towards the establishment of a National Road Safety Council under an Act of Parliament and the setting up of this Study Group on Road Safety, with wide terms of reference. In view of the large time lag that has preceded action in the field of highway safety in this country relative to the U.S.A. and Europe, the measures currently taken in those countries constitute too big an advance to be taken by us in one step. Hence an evolutionary approach towards these advanced measures is indicated. Towards this end, a study of the happenings in the earlier years in other countries is necessary.

Taking the case of the U.S.A., where the highway traffic accidents are an important national problem, with a death toll of 56,000 in 1969 (which in relation to the high per capita motor vehicle usage there as compared to India, reflects a much lower rate than here) the reduction achieved in highway accident rate can be traced to the efforts of many organisations. Through their sustained efforts significant programmes of driver education have been implemented. These organisations also deserve the credit, directly or indirectly, for enactment of much of the Highway Safety Legislation and for many of the improvements in the design of motor vehicles and highways in the country.

The National Safety Council in the U.S.A., chartered by an Act of the Congress is a non-Government, non-profit making, public service organisation which has held the leadership in the Highway Safety movement for over five decades, by offering direct assistance to National, State and Local Government bodies in the development of sound Highway Safety programmes. Its other achievemets include an aggressive programme of High way Safety Education over many years and development of uniform accident reporting procedures.

The Traffic and Safety Division of the Automobile Association of America has also been one of the main supporters of the programme of safety education in schools and has contributed very significantly towards pedestrian safety as well as towards uniformity of laws and traffic control devices. Its pedestrian safety programmes, in which periodic competitions are organised on a national basis for urban communities with different population groups, have to a great extent subscribed towards pedestrian discipline in most of the cities in the United States.

Other organisations which have been active and contributed significantly to highway safety are the Automotive Safety Foundation and the Highway Users' Federation. They have recently combined to form a Highway Users' Federation for Safety and Mobility. By publishing from time to time studies on a world wide basis of the relationship of traffic control and roadway elements to highway safety, they have helped not only the traffic engineers in the right placement of different measures but also in arriving at economic justification for most of them.

Prior to 1959, when the Insurance Institute for Highway Safety was established, the Insurance Business was active in highway safety work through the Association of Casualty and Surety Executives. They formulated for the first time a Manual of Traffic Engineering studies and also ran a competition for improvements to Highway Safety through Traffic Engineering. Examples of the application of Traffic Engineering techniques to various urban areas were collected on a competitive basis. These were evaluated and outstanding ideas helpful in the reduction of accidents, were widely circulated through bulletins issued by that body.

All the above activities augmented the normal road safety work incidental to Government, by way of Enforcement, Engineering and Education. Besides, community activities organised through State and Local citizen groups, also helped road safety work throughout the country. In spite of these significant contributions, there was still an upward trend in the number of accidents following World War II and a concerted national effort through the President's Committee for Traffic Safety and its Action Programme was initiated in 1946. With this programme and the programme of the U.S. Bureau of Public Roads to improve the highways, the accident rates declined slightly, but the population explosion and an even faster growth of vehicle ownership, combined to produce a staggering record of deaths, injuries and property damage each year. It was obvious that public approval of the idea that highway transportation should be made safe did not necessarily mean active public support, but more or less a lip service to activities which affected others.

The total economic loss resulting from road accidents, which exceeded 11 billion dollars a year, set the stage for passage of the Highway Safety Act of 1966. The Act provides for highway safety programmes of the Federal Government and for the development of uniform highway safety programme standards to assist States and other local Government bodies in developing safety. Large sums of money being utilised both by the Federal Government as well as the State Governments in the implementation of these programmes, have been sanctioned. Based on sound research, the programmes direct attention to scientific and rational solutions of the many elements comprising the overall problem. Though it is too early to evaluate the effectiveness of these programmes, the National Safety Bureau and the National Safety Advisory Committee constituted under the Act, confidently expect to reduce substantially the number of all types of motor vehicle accidents.

The trends in the U.K. follow more or less the same lines as in the U.S.A., with highway safety activities being carried out by many organisations both of Government and the public. The more notable of these bodies are the Royal Society for the Prevention of Accidents, the Royal Automobile Club, the Automobile Association and the Road Research Laboratory.

An early effort to study the problem on a national basis was made by the appointment of a Committee on Road Safety in December, 1943 by the Minister of Transport. After a study of the entire problem, this Committee made recommendations through an interim report in December, 1944, and a final report in May, 1947, on an exhaustive basis for measures requiring reorientation, activisation and correction. As in the case of the U.S., the need for creating a statutory base for all these activities was subsequently felt in the U.K. also, which led to the formulation of the U.K. Highway Safety Act, 1967.

While it may not be necessary to go into the details of similar happenings in other countries in these matters, it will be advisable to take note of the following developments. In October, 1971, a Committee of the Council of Europe on economic questions and developments expressing concern over the steep rise in the number of road accidents, which exceeded 80,000 killed and 2 million injured each year in Europe, felt that unless a vigorous road safety programme was initiated, more accidents would follow with a rise in the number of vehicles. The main recommendations include the need for the formulation of a common Highway Safety Code for European countries, ratification of the draft European Agreements resulting from the Vienna Convention of 1968 on Road Signs and Road Traffic and, in addition, implementation of the recommendations of the Joint Conference on Road Safety Education in schools organised by the Council of Europe and the European Conference of Ministers of Transport. The concern for this problem on a world-wide basis is also evident from the proclamation made by the Ethiopean Emperor to observe 1973 as the International Highway Safety Year in his country and his call to the International Road Federation and other international and national organisations to give full support to the cause of road safety on a world-wide basis.

From the preceding review, it is obvious that there is no easy or royal road to Highway Safety and the responsibility is twofold; namely that, in the first place, Government should provide the best official programme fully supported on a proper legal and financial basis and, in the second place, that individuals should conduct themselves as highway users with due regard for the rules of the road and constant consideration for the rights and safety of others. That the individual stands supreme is, however, obvious by the fact that by his action in a fraction of a second, he can either prove to be a safe highway user or defeat the effort which has been expended to safeguard life and property. There is no substitute for individual action and no excuse for individual carelessness. Hence, with this report in the hands of our Government in time, it is hoped that some effective steps will be taken so that India can join the rest of the world in the World Highway Safety year 1973 in a significant manner.

CHAPTER 3

CAUSATIVE FACTORS IN HIGHWAY ACCIDENTS

The causative factors for road accidents can be broadly classified under three heads, *viz.*

(*i*) The road user;
(*ii*) The vehicle; and
(*iii*) The roadway.

Tables 10 and 11 give the cause-wise analysis of accidents in Delhi and Bombay which show a preponderance of the fault of drivers in case of accidents, specially those involving fatal and severe injuries. The figures for various States' and Union Territories show more or less the same pattern (Table 12).

TABLE 10

Primary causes of accidents in Delhi

Sl. No.	Cause of accident	1965	1966	1967	1968	1969	1970
1.	Fault of Driver of motor vehicle .	5,476	5,385	4,501	7,543	7,674	7,578
2.	Fault of driver of vehicle other than motor vehicle	228	198	230	22	11	12
3.	Fault of cyclist .	422	540	609	93	95	85
4.	Fault of pedestrian	310	573	799	14	31	21
5.	Fault of passenger	51	62	69	13	14	35
6.	Mechanical defect of motor vehicle. . .	40	15	39	—	—	5
7.	Defect in road surface. . .	—	—	—	4	2	2
8.	Road berm, soft or defective. .	—	—	—	1	—	3
9.	Result of weather condition (mist, dry, heavy rain etc.). . . .	22	45	62	1	—	—
10.	Other causes .	—	—	—	37	35	35
11.	Cause not known	1,707	1,315	1,485	14	152	17
	Total	8,256	8,133	7,794	7,742	8,014	7,793

TABLE 11

Distribution of road accidents in Bombay according to the causes of accidents

Sl. No.	Cause of accident	Accidents														
		Fatal					Severe injury					Slight injury				
		1965	1966	1967	1968	1969	1965	1966	1967	1968	1969	1965	1966	1967	1968	1969
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1.	Pedestrian's fault	61	58	69	65	95	51	43	38	58	116	4536	4,664	4,962	5,025	4,842
2.	Driver's fault	397	432	477	489	434	288	287	373	542	492	793	911	888	1,253	1,290
3.	Error of judgement	1	2	1	—	1	—	1	1	—	4	135	193	211	242	319
4.	Cyclist's fault	9	8	9	5	8	10	—	5	5	7	218	258	302	368	359
5.	Other faults	4	7	9	10	7	—	3	—	7	7	113	113	183	161	200
6.	Not known	15	10	8	9	7	18	26	18	10	17	270	409	341	391	166
	Total	487	517	573	578	552	367	360	435	622	643	6,065	6,548	6,887	7,440	7,176

TABLE 12

Primary causes of accidents in India during 1969

State/Union Territory	Total	Fault of driver of motor vehicle	Fault of driver of vehicle other than a motor vehicle	Fault of cyclist	Fault of pedestrians	Fault of passengers	Defect in mechanical conditions of motor vehicles	Defective road surface	Bad weather condition	Other causes	Cause not known
1	2	3	4	5	6	7	8	9	10	11	12
Andhra Pradesh	3,027	1,447	152	225	541	36	250	36	10	275	55
Bihar . . .	3,687	2,162	219	127	315	192	131	147	40	142	212
Gujarat . . .	3,191	2,073	154	194	187	14	178	43	82	198	68
Jammu & Kashmir .	159	60	—	3	3	6	25	5	4	4	49
Kerala . .	4,156	2,591	109	121	512	85	249	66	46	180	191
Maharashtra . .	34,077	7,558	867	1,334	5,803	187	964	313	389	15,258	1,404
Nagaland . . .	36	15	2	1	4	1	4	—	—	7	2
Orissa . . .	2,143	1,142	64	59	254	65	258	35	39	173	54
Tamil Nadu . .	11,696	6,895	416	592	1,985	319	587	65	91	593	153
A. & N. Islands .	54	12	4	5	21	—	8	1	—	3	—

1	2	3	4	5	6	7	8	9	10	11	12
Chandigarh . .	113	73	18	—	9	11	1	1	—	—	—
Delhi . . .	8,014	7,674	11	95	31	14	—	2	—	35	152
Dadra & Nagar Haveli . . .	12	2	—	—	1	—	—	—	—	9	—
Goa, Daman & Diu .	665	248	16	21	44	3	141	26	42	111	13
Himachal Pradesh .	231	180	—	—	—	—	29	—	—	22	6
Manipur . . .	116	10	—	4	30	—	10	5	—	27	30
Pondicherry . .	167	68	6	11	22	8	—	—	—	13	39
Tripura . . .	172	75	10	7	30	6	10	—	5	9	20
Total	71,716	32,285	2,048	2,799	9,792	947	2,845	745	748	17,059	2,448

NOTE : The details of accidents in only 18 States and Union Territories in India were available for the year 1969.

The impact of these and other factors on the trend in road accidents is discussed in the following paragraphs :---

3.1. The Road user

3.1.1. Drivers of Motor Vehicles

3.1.1.1. Rash and Negligent Driving

Rash and negligent driving is the most common of the causes of accidents (Photo 3). This is also proved by the analysis in Tables 10, 11 and 12. Whilst, wilful neglect of the rules of the road may be ascribed to some drivers, the condition of the road and inadequate enforcement are also often contributory factors. The more common of these cases are traceable to the actions of drivers of heavy vehicles, who taking advantage of the comparative safety of their big vehicles, often force their way without much concern for the safety of smaller vehicles and other road users. There are several other conditions contributing to rash and negligent driving, such as wide open roads with little or no traffic encouraging too fast a schedule of operation.

3.1.1.2. Drunken Driving

This is another factor which is the cause of many accidents and which is perhaps not taken sufficient cognisance of by the enforcement authorities, for reasons which will be discussed presently. Statistical data in this regard are not available in India, but a report of the World Health Organisation made out that alcohol is one of the causative factors in at least 50 per cent of the accidents throughout the world. From a Study* conducted in Delhi, the incidence of drunkenness among the motor vehicle drivers during the night hours was found to be 27.7 per cent. Among the drivers who were found to have consumed alcohol, 64 per cent had exceeded a blood-alcohol content of 0.05 per cent which is the limit specified in many countries for safe driving. From a similar study conducted in Madras by the Central Road Research Institute, the incidence of drunkenness during the night hours was found to be 28 per cent, although at the time of study, Madras was a dry State. The reason why this factor is very seldom mentioned in the Police records is that the relevant section in the Motor Vehicles Act, *viz.*, Sec. 117, providing for punishment for drunken driving, does not specify a tolerance limit of alcohol content in the blood, so that it is not possible in a Court of Law to prove the charge conclusively.

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*Dr. N.S. Srinivasan, Dr. S. K. Bhalla and S. M. Lal Bhatnagar, "A Preliminary study on drunken drivers in Delhi", Transport-Communications Quarterly Review, December, 1970.

3.1.1.3. **Disregard of Traffic Rules**

As pointed out earlier under the heading rash and negligent driving, it is also quite often observed that other traffic rules are not strictly followed, such as traffic signals being ignored, corners being cut while making turning movements, queues being jumped, overtaking done from the wrong side and lane discipline not strictly adhered to. In a study conducted in Delhi, the violations at signal controlled intersections were analysed and the results of the study are given in Table 13.

PHOTO 3—Accident as a result of rash driving

TABLE 13

Details of different types of vehicles violating traffic signals

S.No.	Intersection and approach arm studied	Type of vehicles														
		Heavy			Car, Jeep taxi, etc.			Motor Rickshaw			Motor cycle/Scooter			Bicycle		
		Total	*Violations*		Total	*Violations*		Total	*Violations*		Total	*Violations*		Total	*Violations*	
		number of vehicles	Total num ber	Percentage	number of vehicles	Total number	Percentage	number- of vehicles	Total number	Percentage	number of vehicles	Total number	Percentage	number of vehicles	Total number	Percentage
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1.	Subhash Marg-Chandni Chowk (South-arm)	76	9	11.8	262	24	9.2	336	36	10.6	234	41	17.4	920	335	36.4
2.	Panchkuian Road Connaught Circus (West arm)	24	2	8.2	444	69	15.5	307	24	7.8	404	69	16.7	1,293	342	26.3
3.	Barakhamba-Road Connaught Circus (East arm)	42	8	19.2	390	54	13.9	101	11	10.7	355	30	9.2	791	199	25.0
4.	Subhash Marg-Chandni Chowk (North arm)	93	3	3.2	320	22	6.9	243	13	5.3	189	30	15.8	514	76	14.7
5.	Subhash Marg-Urdu Bazar (South arm)	125	6	4.8	382	31	8.1	556	44	7.9	388	40	10.3	1,378	313	22.6

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
6.	Subhash Marg-Urdu Bazar (North arm)	100	3	3.0	233	9	3.8	504	11	2.1	177	11	6.1	676	133	19.6
7.	Minto Road-Thompson Road (North arm)	60	11	18.3	346	45	13.1	322	58	18.0	205	60	29.1	385	130	34.0
8.	Panchkuian Road-Chitra Gupta Road (West arm)	3	1	33.3	122	13	10.4	68	7	10.3	109	25	22.9	276	130	47.0
9.	Panchkuian Road-Chitra-Gupta Road (East arm)	10	2	20.0	235	31	13.0	172	32	18.4	265	77	29.2	930	438	47.1
10.	Talkatora Road-R.K. Ashram Road (East arm)	38	2	5.2	251	30	11.9	77	9	11.6	457	73	15.9	785	283	36.0
Average of all Intersections		57.1	4.7	8.2	298.5	32.8	11.0	268.6	24.5	9.1	278.3	45.6	17.4	787.6	217.9	27.6

Similarly, another study conducted in Delhi by the Central Road Research Institute showed that about 60 per cent of the right turning traffic at intersections, cut across the corners where there were no channelisers. Table 14 shows the traffic at Rajpath—Mansingh Road Crossing, before and after channelisation.

TABLE 14

Traffic movement at Rajpath-Mansingh Road crossing before and after channelisation

Physical features	Arm number	Straight going	Left turning	Right turning traffic				Grand total
				Wrong		Correct turning	Sub total	
				Mid way	Direct			
1	2	3	4	5	6	7	8	9
Before channelisation	1	466	5	10	10	9	29	500
	2	449	16	9	14	8	31	496
	3	536	14	6	10	5	21	571
	4	411	7	9	11	11	31	449
After Channelisation	1	550	9	—	—	27	27	586
	2	480	15	—	—	34	34	529
	3	573	13	—	—	20	20	606
	4	521	6	—	—	25	25	552

3.1.1.4. Driving at Night with Main Beam of Head Lights

This is one of the common failings of our drivers in night driving, specially on the dark or badly lit roads that we generally have in rural areas and also along many of the roads in our cities and towns. Driving courtesy imposes a special responsibility on the driver that the on-coming driver is not handicapped by the dazzle of the head lights. To avoid this, it is imperative that as the vehicles approach from opposite directions the main beam should be switched off and the dipper used instead. so that the two vehicles can pass each other safely. Contrary to the above requirement, many of our heavy vehicle drivers are given to the practice of blinding on-coming vehicle drivers by using both the main and dipped beams of their headlights simultaneously, to gain advantage over the latter.

3.1.1.5. Driving by the Physically Handicapped

Once a person gets a driving licence, its renewal from time to time is not subject to further tests. But in course of time, his fitness to drive safely may deteriorate and some persons may even develop infirmities. Many physically handicapped drivers are still driving vehicles to the detriment of road safety. From a study* conducted in New Delhi on drivers who were involved in fatal and severe injury accidents, it was found that quite a large percentage of them had monovision which affected their judgment of distance. Likewise, on further study, other defects such as poor reaction time, and colour blindness may also be found to be very widely prevalent.

3.1.1.6. Driving under Fatigue

Permissible working hours for drivers of commercial vehicles are prescribed by law, but they are seldom observed or enforced, specially in the case of long distance goods carriers. The result is that many of them drive for unduly long hours at a stretch to make up for time lost enroute, due to their own faults or to other causes. They occasionally do so, to earn more money for themselves, by exceeding their targets. It is no wonder, therefore, that drivers get fatigued and may even go to sleep while on the steering wheel, thus causing many serious accidents.

3.1.1.7. Overspeeding

Quite often there are cases of vehicles being driven at higher speeds than are permissible. This is particularly true of commercial transport vehicles, such as taxi cabs, goods carriers and buses. In their effort to make the maximum mileage in working hours, they overspeed and thus account for many accidents on our roads. Since the controllability of vehicles at such high speeds is limited, the inevitable result of accidents in such cases is their higher severity as compared to those caused by vehicles violating other traffic rules.

3.1.1.8. Driving Standards

Inadequate resources to train and test drivers and want of a thorough test to check and certify their ability, result in the issue of a driving licence to many and underqualified diver. Certain

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* Dr. N.S. Srinivasan, Dr. S.K. Bhalla, and S.N. Lal "An appraisal of the skill of drivers involved in serious accidents" Report of the Central Road Research Institute, New Delhi.

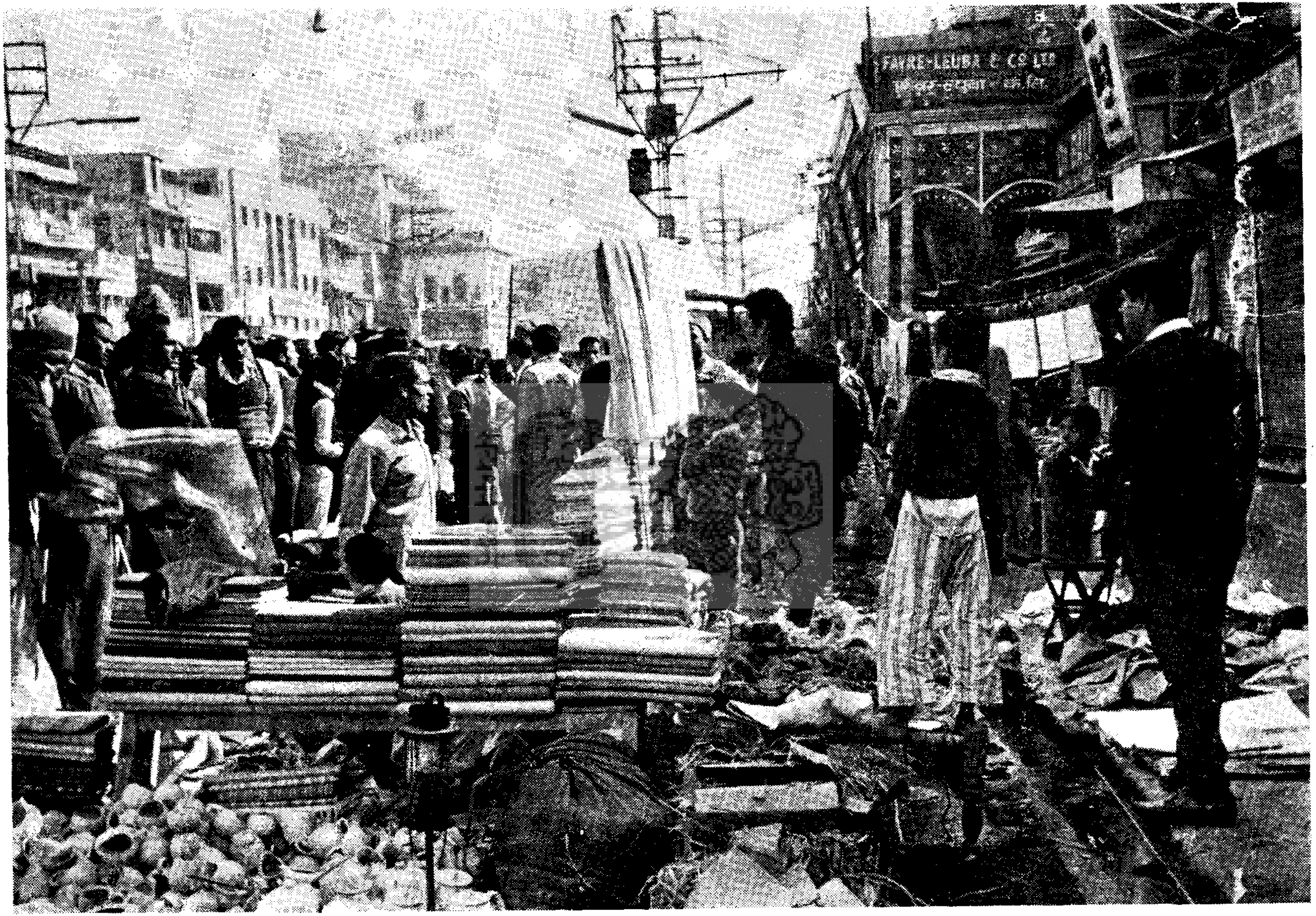

PHOTO 4—Encroachments on a sidewalk

latent shortcomings of such drivers come to the surface only when they face a hazard, calling for a prompt and correct decision to avert an accident.

3.1.2. **Other Road Users**

3.1.2.1. **Cyclists**

Cyclists constitute a very large percentage of traffic in most of our cities. As no licence is required for riding a bicycle, they do not feel obliged to acquire a knowledge of traffic rules and regulations. From a study conducted in Delhi, it was found that a sizeable percentage of them did not know answers to even simple questions on traffic rules, regulations and signs. Plying cycles without lights, reflectors, or bells and with poor or no brakes, account for many accidents. Otherwise also, cyclists generally disregard traffic rules and regulations, *i.e.* making turning movements without any signal, riding double or sometimes triple abreast, catching hold of fast moving vehicles and getting towed, carrying heavy unwieldly weights, etc. All these unsafe practices substantially contribute to road 'accidents (Table 12).

3.1.2.2. **Pedestrians**

Pedestrians are the worst sufferers in road accidents. Unlike other road users, they are not adequately governed by traffic rules and regulations, nor is there a sizeable effort on the part of the administration, to acquaint them with all the requirements of road usage. They also sometimes behave erratically on the roads. They have a feeling that drivers of motor and other vehicles should consider themselves responsible for the pedestrians' safety (Table 11). This carefree attitude on their part often results in unsafe traffic conditions. The situation is further complicated by villagers occasionally coming to cities and failing to adjust themselves to the local traffic requirements. The lack of pedestrian facilities and their misuse (Photo 4) where available, is yet another factor that aggravates the problem.

3.2. **The Vehicle**

The mechanical condition of a vehicle plays an important role in accidents, some of the aspects of which are discussed in the following paragraphs.

Table 15 shows an analysis of the available data on the condition of motor vehicles involved in accidents in India during the year 1969. According to it, 52.0 per cent of them had mechanical defects (Sl. No. 1, 2, & 3 in Table 15), 21.0 were overloaded, 7.1 had insufficient lights and 5.8 per cent had punctures.

TABLE 15

Condition of vehicles involved in accidents in India during 1969.

Sl. No.	Condition of motor vehicle	Accidents Number	Percent
	1	2	3
1	Defective brakes	1,785	25.6
2	Defective steering	674	9.7
3	Other serious mechanical defects . . .	1,165	16.7
4	Overloaded	1,460	21.0
5	Insufficient or no lights	497	7.1
6	Puncture or burst	401	5.8
7	Left hand steering	985	14.1
	Total	6,967	100.0

NOTE : The details of only 6967 accidents out of 71716 were available.

3.2.1. Manufacturing Defects

This is being widely discussed both in Government and Public circles. The quality of vehicles manufactured in this country leaves much to be desired.

Safety fittings such as seat belts, collapsible steering columns, padded dash boards, without any protruding knobs, wing mirrors, etc. are not yet seriously thought of by our manufacturers. Further more, the quality of the vehicle itself basically is getting worse with the use of inferior sheet metal for the body and of accessories and fittings of poor quality. Hence, unless a special effort is made to correct the situation, the vehicles now plying on our roads as well as the new ones to come, will be constantly vulnerable to accidents.

3.2.2. Maintenance and Inspection

In the absence of adequate facilities for repair and maintenance, many vehicles plying on our roads, particularly the commercial ones, do not conform to the required standards of road worthiness. Even in the case of some of the commercial vehicles owned by Government and semi-Government departments and Corporations, there has been a considerable decline in their upkeep, which is often attributed to the shortage or the poor quality of replacements of their parts.

The surprise checks of commercial vehicles carried out by Motor Vehicle Inspectors, is not an adequate safeguard for ensuring their fitness. Even periodic checks for fitness certificates for commercial vehicles, do not ensure their continued fitness in the interval between their checks. The position in regard to cars and other private vehicles, which are not commonly subject to such checks, is even worse in some cases.

3.2.3. Malpractices in Vehicle Usage

Amongst many other causes leading to accidents, overloading by both trucks and buses stands out very prominently. There is a tendency amongst truck and bus operators to add to their margin of profit by overloading, even at the risk of damage to their vehicles or of being involved in accidents.

Likewise, in many areas, the limited number of passenger buses and taxis, contributes to over loading. The prescribed low fare structure also occasionally encourages overloading. In the case of some remote areas not subject to adequate checks, this practice of overloading is alleged to be in vogue even in Government-owned vehicles, the additional income from it being shared by the operating staff. In several cases in this trade, light vehicles such as tempos have been found to be overloaded far beyond their capacity (Photo 5) without the users being aware of the perils to which they are subject in the event of even a small mishap.

3.3. Roads

Causes of street and highway accidents lie in human behaviour and in external conditions. The latter are made up of two parts, *viz.*, the vehicle (dealt with in the previous section) and the road. The successful approach to road safety, therefore, lies in bettering the condition of the vehicle and the road so that human errors and misjudgement are less likely and prove less hazardous. Quite often in this country, the causes contributory to accidents from the angle of roads and vehicles are lightly treated and human failures only highlighted. This has led to apathy on the part of many highway authorities towards their responsibility to highway accidents and thus resulted in the lack of prompt consideration of the needed improvements to roads.

Though the roads cannot be made proof against the accidents caused by reckless driving, improvements to them will be of immense value in accident reduction, as in the majority of accidents that occur, those involved normally exercise reasonable care but prove victims for their occasional lapses. Such accidents are seen to occur in every imaginable way. They occur at random amongst all drivers, with varying degrees of driving skill. Therefore, if the roads and the regulations for their use are designed to fit the traffic conditions and known patterns of human behaviour, a significant reduction in the severity and frequency of accidents can be expected. To achieve this, it would be necessary that (*i*) every serious accident is analysed to see whether any road feature or deficiency contributed to it, (*ii*) the results of the analysis are applied to a correction of the condition, and (*iii*) these results are also considered in relation to design standards, construction and maintenance practices and traffic regulation and control.

The Study Group during the course of their discussions with highway engineers as well as the inspection of many city roads and national highways, could clearly see that adequate concern in this regard was not currently being shown, possibly because they are not directly charged with the responsibility towards this work. The present limited awareness in this regard has to be overcome, before conclusive proof for the magnitude of contribution of highway and street deficiencies to road accidents can be provided and inter relationship of road factors to accidents established. However, it was quite apparent from the accidents seen by the Study Group during their visits or described to them that the existing road conditions did make a major contribution towards their frequency and severity.

Tracing back to the origin and development of roads in the country, the present system of main highways date back to the Mughal and even pre-Mughal periods, when they were constructed essentially for military purposes. They were later improved in a limited way during the British regime for maintenance of law and order. They are all essentially very narrow, tortuous

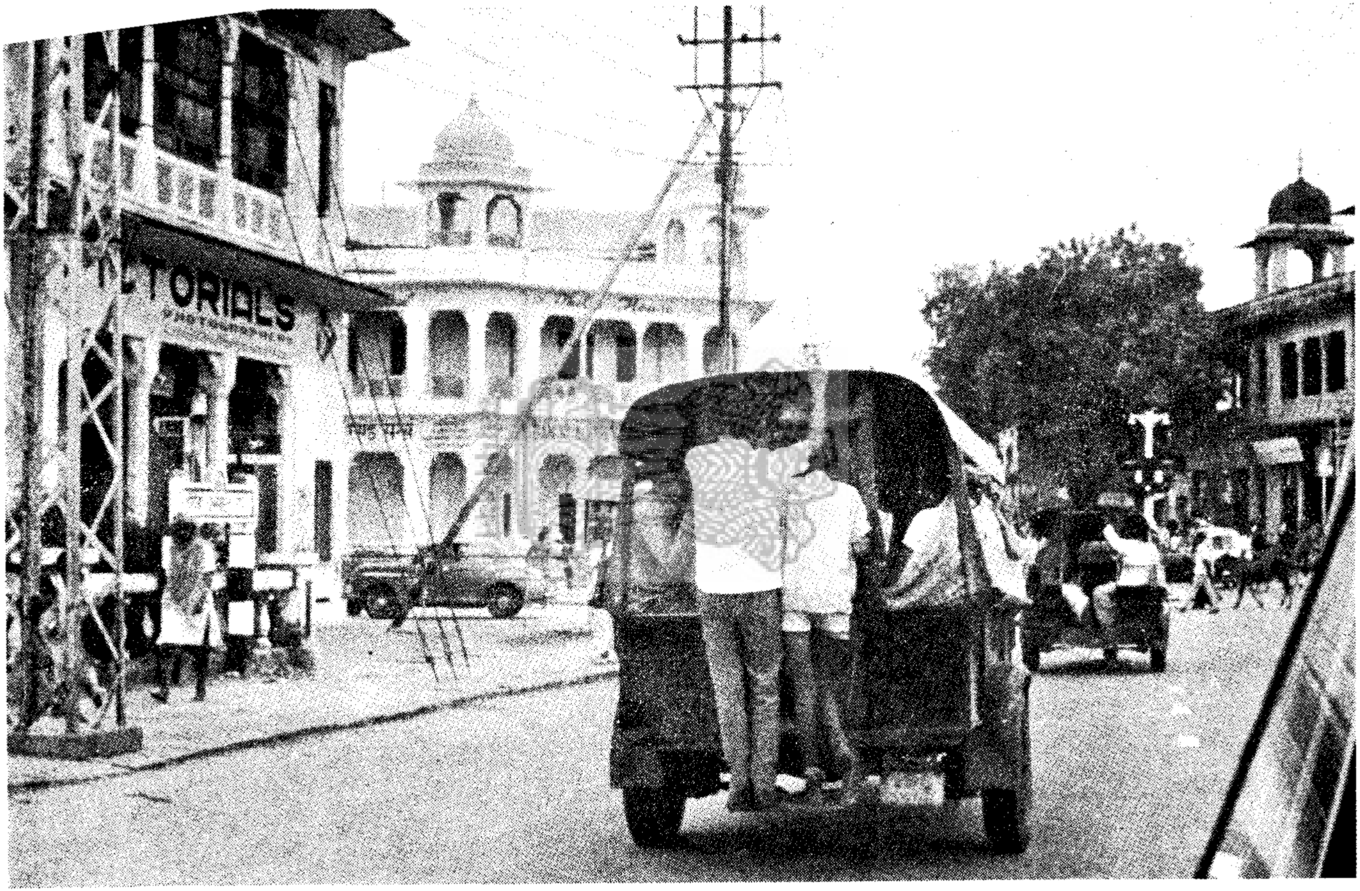

PHOTO 5—Overloading of Commercial Passenger Transport Vehicle

in their alignment and suffer from many inadequacies, *vis-a-vis* the present day motor traffic which has made a phenomenal increase during the post independence period. The improvements that have been made during the last two decades are mostly in respect of the surface of the National and State Highways of which even today a very large mileage is of single lane width only. Barring a limited mileage of very highly trafficked national and State highways with modern surfacing of two lanes in asphaltic or cement concrete, the rest has been provided with only light duty bituminous surfacing. Though these highways are classified as modernised all-weather roads, they do not keep up their good condition beyond a short period and where rainfall is moderate to heavy, their condition after the rainy season leaves much to be desired for safe motor travel. The other conditions of these roads like poor shoulders, narrow culverts and bridges, sharp and numerous curves and steep grades both limiting the sight distance, and numerous low level causeways and submersible bridges are perennial hazards. They tell on the nerves of the drivers, causing fatigue and leading to errors and misjudgement whilst driving.

The Indian Roads Congress have formulated geometric standards for the different classes of roads like National and State highways, major and other district roads and village roads. These standards relate the features of cross section (like right of way, paved width and shoulders) and of alignment (like minimum radius of curvature and grades) to specified maximum speeds. They have yet to relate these design standards to variation of traffic type and volume. Even if funds and organisation were available to up-grade all the highways to these standards which are only moderate in respect of safe modern motor travel, many of the accidents on these highways could be averted. But the back log of deficiencies is so much that possibly even the national highways may not come up to this requirement by the end of the Sixth Five Year Plan. Hence, only a selective basis of improvement, taking into account the exact location and type of serious accidents, is possible immediately.

In regard to roads and streets in built-up areas like towns and cities, where motor vehicle travel is fast increasing, the position is no better than on the main highways. Most of these developments are of the pre-automobile periods with narrow and unplanned roads and unregulated land use abutting the road sides. In spite of the large scale urbanisation necessitating the expansion of these towns and cities, the old development still continues to be the core of activity catering not only to the requirements of the old city but also to the subsequent development. With pressure on land use for other requirements like housing, the roads in the core area permit of little improvement. Yet, they have to accommodate not only the automobiles but also other vehicles like tongas, rickshaws, bicycles, bullock carts and hand carts, not to speak of the pedestrian who has often to share the road with them. The planning of the early years bringing the building frontage right on to the roads and having frequent cross streets, makes the situation worse, with limited sight distance at corners and numerous directional conflicts for vehicles.

Examples of modern city planning are few like New Delhi, Chandigarh, Bhubaneshwar, industrial towns like Bhilai and Rourkela and extended areas of some metropolitan cities. Even in several new city plans, traffic requirements are not given adequate consideration and road space is sacrificed to meet the pressures for maximum areas for other uses. To date, there are no commonly adopted standards amongst city planners in the country for the development of roads in urban areas nor are they considered earnestly for re-development. Improvements, if any are mainly due to a few enthusiastic administrators who carry the public with them in their improvement plans. These sporadic outbursts of efforts are not adequate to meet this problem. Only a regular plan, both short as well as long term, for development of roads, which takes into account the possible changes in land use and the growth of traffic and is implemented in a sustained manner, can bring about an improvement in safety.

Amongst numerous deficiencies that prevail in our highways and streets, some can be easily spotted out for their contribution to a majority of accidents. In the case of highways, they are (*i*) single lane pavements, (*ii*) poor shoulders, (*iii*) non-standard pavement widths, (*iv*) isolated sharp corners, (*v*) poor road junctions, (*vi*) poor and slippery road surface, (*vii*) lack of warning signs, (*viii*) deficient approach sections to large towns and cities, (*ix*) railway crossings, and (*x*) narrow bridges (Photo 6). Added to these are the malpractices in the use of the highways such as the drying of food grain and hay and the presence of stray cattle.

In the case of city streets, they are (*i*) inadequate roadway widths, (*ii*) lack of proper footpaths and pedestrian crossing facilities, (*iii*) mixed traffic, (*iv*) lack and non-uniformity of traffic control devices, (*v*) inadequate street lighting, (*vi*) kerb parking, and (*vii*) lack of facilities for loading and unloading. The situation is made worse by misuse of footpaths by hawkers and by uncontrolled vehicular accesses to property.

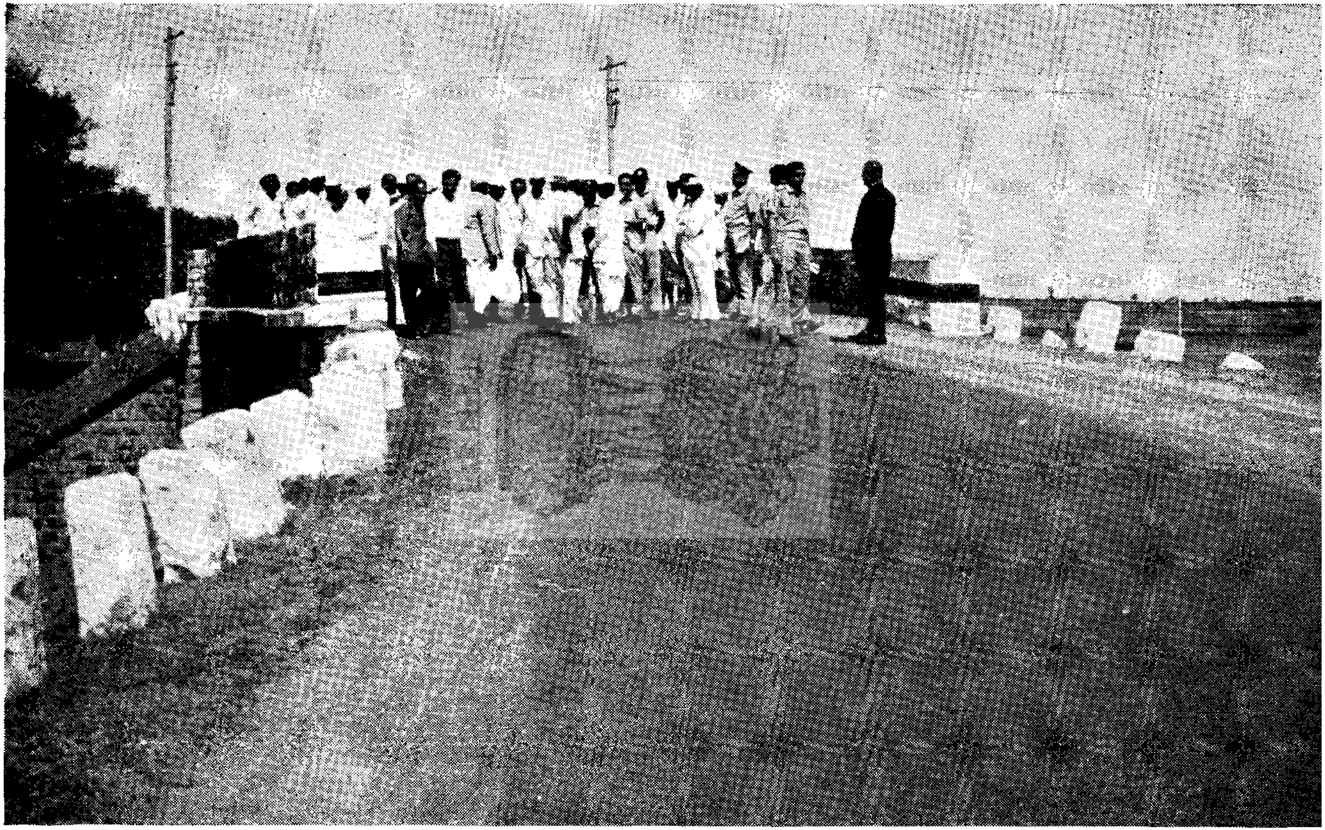

PHOTO 6—Narrow Bridge on a combined Vertical and Horizontal Curve—A Place of Accident Occurrence

3.3.1. Rural Highways

3.3.1.1. Single Lane Pavements

These form a very large mileage of our highway network and exist even on many heavily trafficked sections of the highways. They are responsible for frequent swerving of vehicles to the side, with one set of wheels only left on the paved surface to accommodate the on-coming traffic or to permit overtaking. Since the shoulders of such highways mostly unsuitable for driving, the vehicles have to move too close to one another and the slightest misjudgement may lead either to a head-on collision or a side swipe. They also encourage the tendency of many drivers to hug the centre of the road far too long, thus obstructing the traffic both ways and giving rise to many accidents. They are moreover responsible for vehicles particularly the commercial ones and buses, running at high speeds to go out of control and collide with side obstructions such as trees and poles or plunge down the side slopes. Conditions, needless to say, are made infinitely worse during the rainy season, which lasts for four to five months a year in most parts of the country. While the above handicaps are common to single lane pavements of a standard width of 3.5 metres, there are even many stretches with the paved surface varying from 2.5 to 3 metres in width. On such stretches the modern trucks and lorries having a body width upto 3 metres, leave no margin at all for free movement and driving them along such roads is frought with danger.

3.3.1.2. Poor Condition of the Shoulders

Shoulders of roads in modern highway design have the essential function of accommodating stopped vehicles off the traffic lane. But in a single lane carriageway, they have to be constantly used for overtaking and passing manoeuvres, thus requiring a firm surface capable of taking the load. Contrary to this minimum requirement, in most of our roads they are of irregular and narrow widths, made up of soft moorum, totally unfit for service even in fair weather. But in the monsoon, they lose all their supporting value and it is not an uncommon sight for vehicles to get bogged under their weight even when their wheels are on the shoulders. In addition, their slushy condition causes the mud from their surface often to spread on to the paved surface which presents a constant potential for skidding. There is a school of thought amongst some highway engineers, who are purely cost conscious, that any intermediate structural improvement of the shoulder leads to its use regularly by traffic, thereby soon

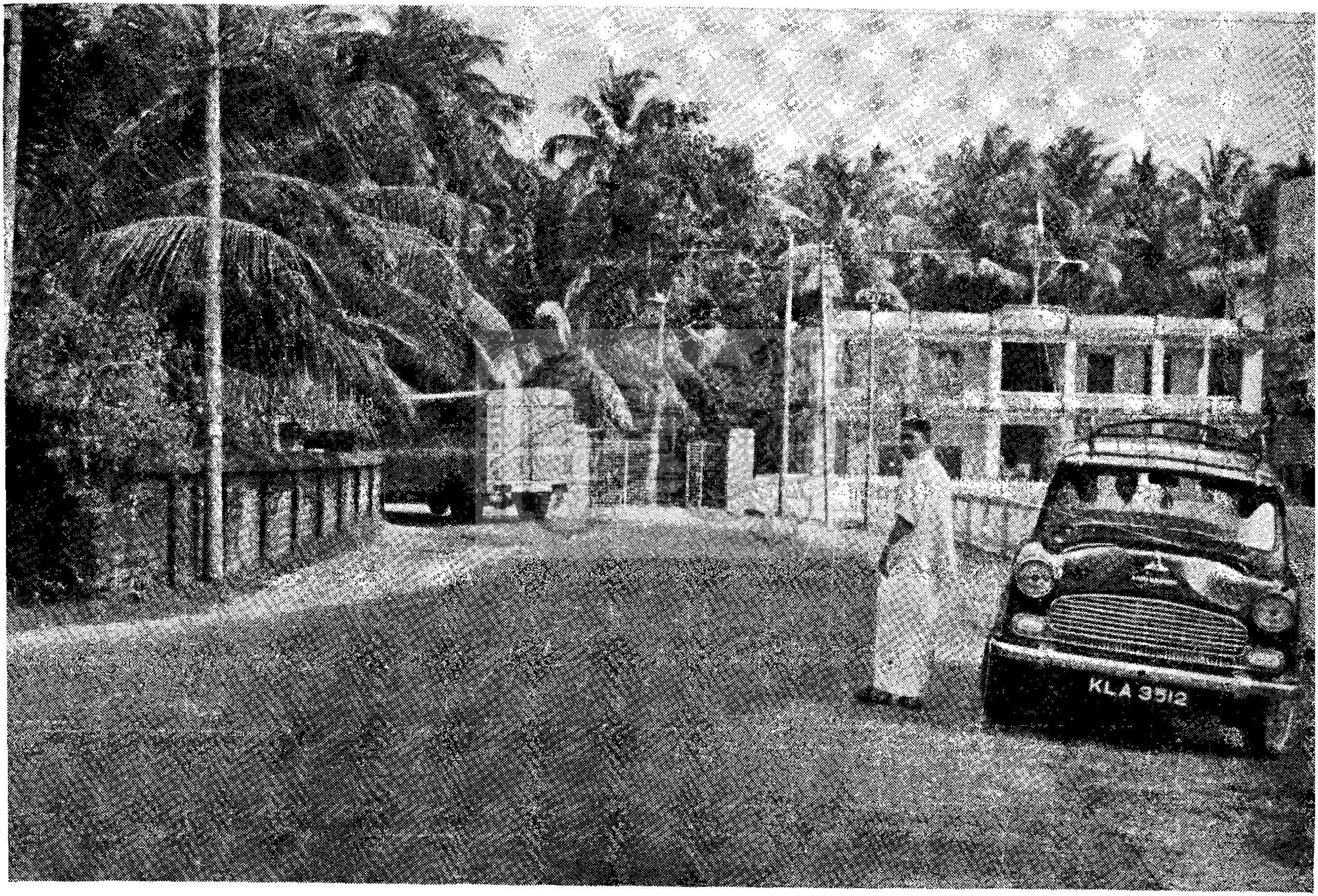

PHOTO 7—A curve with inadequate sight distance on a National Highway

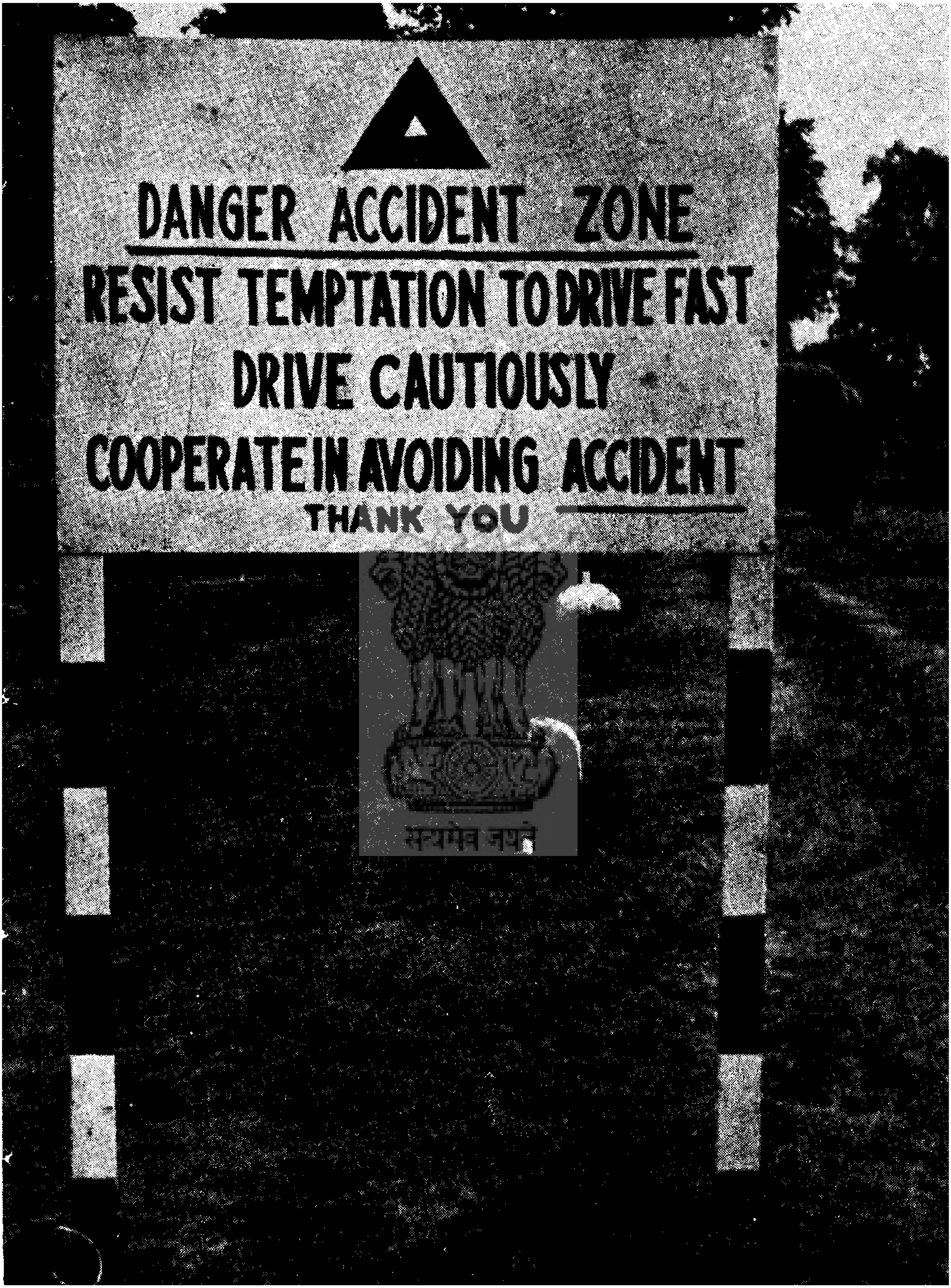
DANGER ACCIDENT ZONE
RESIST TEMPTATION TO DRIVE FAST
DRIVE CAUTIOUSLY
COOPERATE IN AVOIDING ACCIDENT
THANK YOU

PHOTO 8—An oversized warning sign at an accident zone destroying it. This approach does not reflect adequate regard for safety. If its surface is not as good as it should be, it should at least be firm enough to sustain any load in the rainy season. In the case of single lane roads of 3.5 metres width, such firm shoulders should be at least a metre in width.

3.3.1.3. Non-Standard Widths of Carriageway

There are large stretches of roads with widths varying from 5 to 6 metres, which have been widened by stages from a single lane. They have the apparent look of two-lane carriageways encouraging vehicles to be driven too fast which leads to many head-on collisions. If there is at least a centre line marking to keep the vehicles to their sides, many accidents can be averted but such markings are seldom to be seen.

Though the present I.R.C. standard width for two-lane carriages ways is 7 metres, many of them have still a width of 6 metres. This combined with the lack of firm shoulders discourages vehicles from keeping close to the edge of the pavement and as such is quite hazardous to driving at high speed.

3.3.1.4. Isolated sharp curves

There are numerous cases of blind curves (Photo 7) along otherwise straight alignments of roads, necessitated by physical obstructions, such as built up areas. Vehicles approaching them at high speeds, some times ignoring the advance warning signs where posted, lose control and either collide against an on coming vehicle or leave the carriageway to hit an obstruction at its side. To guard against such contingencies, an over-sized warning sign (Photo 8) or a repetitive advance warning, which will not escape the attention of drivers, coupled with speed restrictions, is the only answer.

3.3.1.5. Poor road junctions

There are numerous cases of right angle and oblique road junctions, where cross roads join the main highways without adequate widening for smooth entry and exit. In addition, at such locations, the sight distance is also restricted by obstructions such as trees or road-side shops. Drivers who are not sufficiently cautious, do not exercise care to reduce their speeds and also make abrupt manoeuvres for turning, thus obstructing other approaching traffic. Under these surprise situations, avoidance of collision or of running over of pedestrians is difficult. Proper flaring of such junctions, improvement of sight distance, warning signs including blinkers at night and proper street lighting where possible are the minimum requirements for such road junctions.

3.3.1.6. Poor and slippery road surfaces

The surfaces of roads as soon as they are opened to traffic are subject to constant wear and where the standards of construction do not measure up to this requirement, sooner or later they show many defects such as pot holes and ruts. They present a constant danger to traffic movement, unless rectified soon enough by proper maintenance. These defects are aggravated by rain and snow. Where they cannot be rectified soon enough, warning signs should be put up. Even in the case of durable pavements, there is a tendency for them to acquire too smooth a surface for the stoppage of vehicles within a reasonable distance under braking. The situation is made worse during the rains and sometimes even by the dripping of oil from vehicles. There are also locations where leaves falling from trees or mud washed from the sides to the road surface, give rise to similar conditions. A constant vigil is called for against such conditions to warn motorists in advance of the safe speed to be adopted.

3.3.1.7. Lack of road signs and Non-uniformity

Road signs are the simplest expedients to convey to the road user adequate messages as regards desirable speeds, destination directions, warning of hazard and other information relevant to the use of the road. For ideal conditions, only information signs need be used, as others are all restrictive. But with a highway and street conditions beset with many deficiencies, a liberal use of these road signs is the only means to regulate driving and avert the danger of accidents. Currently, enough effort is not made in this direction and road signs are installed only when compelled by circumstances. Actually, it is desirable to plan all the signs at the design and construction stage of a road and provide for their installation before throwing it open to traffic. On existing roads a careful survey is needed to assess the requirements and signs should be installed and maintained in good condition without loss of time. For their proper observance they should conform to the required standards.

To overcome the handicaps of language, symbolic signs in conformity with the international signs have been prepared by the Indian Roads Congress and their use should be made mandatory in supersession of all non-standard signs. The public should be educated by all available means about the meaning of these signs, so that the indications are properly observed. Increasing use of reflectorised signs should be made for improving their visibility at night and, in some special cases, they may be illuminated also.

In the erection of road signs, care should be taken for their proper location, in order that their mountings are kept sufficiently away from the carriageway so as not to endanger vehicles swering off it.

3.3.1.8. **Approach sections to large towns and cities**

Currently, two lane and single lane roads approaching town areas are not widened over sufficiently long stretches to accommodate the build-up of traffic on them, which is of a mixed character, such as automobiles, slow moving traffic, cyclists and pedestrians. The abrupt change of driving codition irritates the already fatigued driver to the extent of his getting involved in accidents. Hence the widening of such stretches to allow for segregation of different types of traffic, the provisions of footpaths and also of adequate street lighting for them are essential to ensure road safety. Jurisdictional formalities often hold up the implementation of such improvements. Hence concerted action is called for towards it.

3.3.1.9. **Railway crossing**

There are numerous rail crossings along our highways with gate control in most places and in a few places without any control. These crossings are located at many places where there is an abrupt change of alignment of the road or its grade resulting in a poor sight distance. While drivers familiar with them observe the normal precautions in negotiating them, others not so familiar run into trouble. In addition, to avoid long hold-ups at these crossings, such of the drivers as are conversant with the train timings speed up to clear them at the nick of time, thus running the risk of accidents. Besides, the condition of the roadway at these crossings leaves much to be desired, as it is not the responsibility of the highway department to maintain it. This leads sometimes to the break down of vehicles at crossings, endangering their safety. Hence all unmanned points must be manned and provided with gates. Where the number of trains at such crossings is more than twelve or where the daily volume of road traffic exceeds five hundred vehicles, there is a case for an over or an under-bridge being provided. Where these level crossings are not visible from approach roads, over-sized warning signs should be provided so that they are not missed.

3.3.1.10. Narrow Bridges

There are numerous locations in our highways, where the bridges are much smaller in width then the main road, thus constituting a hazard to two-way movement. The visibility of their parapets at night is limited and as a change of direction is occasionally involved in the movement of vehicles approaching them, they sometimes collide against them with serious consequences. Cases are also not rare of such vehicles overrunning the roadway and falling into a ditch. In many cases the over-bridges across railway lines are narrow with steep approaches on curves. The limited sight distance obtaining under those conditions constitutes a permanent potential for accidents to vehicles approaching them from opposite directions.

It has also been noticed that where such narrow bridges are being widened, the traffic is sometimes maintained along half the road width without proper barricading or lighting arrangements at night for the other half. This is dangerous and must be avoided.

Where narrow bridges occur, advance warning signs should be displayed and the ends of the parapets of such bridges should be painted, preferably with a reflectrorised paint, to ensure their good visibility by night.

3.3.1.11. Stray cattle

Cattle grazing along the road sides, often without an attendant to look after them present a common sight. At times they stray on to the road and obstruct traffic, thus causing a number of accidents. Apart from such stray cattle, large herds of them are often to be seen being driven for long distances along the road to markets or slaughter houses. Their presence on the road is also responsible for a number of accidents (Photo 9).

3.3.1.12. **Obstructions on the roads**

Very often the roadway is obstructed by road building materials dumped on it in a manner that seriously interferes with the flow of traffic on it. Likewise, some disabled vehicles are to be found abandoned on it, causing obstruction to traffic. Quite often, as a sequal to this, vehicles running at high speeds and coming suddenly against such obstructions, come to grief.

3.3.1.13. **Roadside obstructions**

Numerous vertical obstructions occur at the sides of the road which constitute a serious hazard for vehicles leaving the carriageway through skidding or otherwise. The more common of them are the roadside trees, utility poles, milestones, stock piles of road metal and casual storage of construction equipment such as road rollers, asphalt drums, concrete mixers and batching plants.

Roadside trees have been a traditional complement of all our old roads including the main highways. Planted with an eye on the provision of shelter from the sun to foot and animal traffic, they are accepted as essential to road use. Through the years, the types of trees to be planted and their suitable locations have been a matter for study and practices have been standardised differently in different States. These studies, however, have not taken into consideration the danger spelled by them to motor vehicles and their occupants, in the event of their leaving the carriageway and colliding with them. The utmost safeguard so far taken is to improve their visibility by painting their lower surfaces in bands of white, red and other colours. Recent findings in face of the prevalence of high speed motor vehicle traffic, have been that in a large proportion of accidents, vehicles leave the carriageway and hit such obstructions. The vulnerability to accidents from the roadside trees gets accentuated by the road conditions such as their poor surface characteristics like undulations and unevenness or their slippery conditions created by adverse weather like rain and snow. Therefore, their is a case for a proper study of this problem on the main highways along which motor vehicle traffic is bound to increase largely in the years to come. Likewise, in the construction of special roads for motor vehicle traffic, to start with, this point should be considered along with other factors of design. A large volume of literature is available regarding the improvement of roadside environment by the planting of trees and other greenery. New standards for such roadside features have been evolved in connection with motorway designs.

PHOTO 9—Accident caused by a Stray Cattle

Whilst the Study Group at this moment does not endorse the removal of all roadside trees, it would strongly suggest adoption of a phased programme for the removal of trees close to the road, with a fairly high priority for the heavily trafficked sections of national and state highways and their substitution by proper planting at a safe distance. The minimum safe recovery areas considered necessary for vehicles straying off the road at high speeds is a width of 10 metres in which in addition to removal of the vertical obstructions, the banks also require to be re-profiled for a gradual slope of 1 in 6 or more.

The arguments which hold good against roadside trees, would also apply to other obstructions like utility poles, which have likewise to be shifted to safe distances. Milestones and roadside sign posts today are so designed that they cannot be tampered with or removed easily by mischievous elements. This approach neglects the road safety aspect. The materials to be used for them and their location should be such that they do not constitute a serious hazard to vehicles hitting them.

In regard to other obstructions like stacking of road metal, placing of construction equipment etc., the matter is primarily one of awareness on the part of the construction and maintenance staff of road organisations.

3.3.1.14. **Lay-byes in roads in rural areas and passing zones**

Vehicles using the highways, particularly buses and trucks, are required to stop en route either for repairs or for loading and unloading of passengers. If additional areas are not provided for this requirement, they park on the roadway, thus obstructing the free movement of traffic. In addition, the view of the passengers alighting from or boarding them is sometimes obscured by the standing vehicles and they are run over by vehicles passing that way. Hence, it is necessary to provide lay-byes in the form of loops, taking off from the road for the above purpose. These loops should be at least 30 meters long and should alternate on either side of the road at reasonable distances. Provision should be made for them, particularly near built-up areas and they should be provided with good paved surface to encourage their use.

In the case of single lane roads, if the volume of traffic in opposing directions is high, their paved surface should also be widened to two-lanes over a length of 30 to 40 meters at intervals of about 500 meters, so that by usage, drivers get familiar with them and adjust their speeds suitably to pass on-coming vehicles at these locations with safety. The widening should be done with transition sections, in order that the swerving of vehicles to these widths is not required to be done abruptly.

3.3.2. Roads in urban Areas

The following are the deficiencies in the net-work of streets in towns and cities which highly impair road safety.

3.3.2.1. Inadequate roadway width

As pointed out earlier, the widening of roads and streets in urban areas is beset with numerous difficulties in clearing abutting properties. The traffic on these streets is constantly on the increase and is composed of a wide variety of vehicles. The size and speed differentials of such vehicles constitute a continuous danger to their safe movement. At a certain level in the volumes of different types of traffic, there arises a need for segregation and where this is not found practicable, regulations have to be restored to for either eliminating the slow moving traffic completely or limiting them to restricted timings. Instances are also not wanting, where the condition of the road surface at the sides is not satisfactory, thereby inducing all the traffic to compete for space at the centre of the road, thus adding to its hazards. Indirectly, this proneness of many vehicles hugging the centre of the road amounts to flouting of the basic law of traffic of keeping to the left, besides leading to the unhealthy practice of over-taking of vehicles from the left. Provision of a proper roadway surface from kerb to kerb and proper lane markings combined with rigorous enforcement, should help in the correct use of the road.

3.3.2.2. Lack of foot-paths and pedestrian crossings

With increased demand on the available road space for the use of vehicular traffic, even the available foot path space is quite often encroached upon for widening of the road. The reduced foot path widths combined with the wide spread misuse of foot path space by hawkers and others often results in pedestrians straying on to the carriageway, thus endangering themselves as well as causing obstruction to vehicular movement. Added to these conditions is the location of water and sewer mains, telephone and power lines, utility poles, plantings, milk and other booths in the foot path and the frequent disturbance to its surface for repairs. This situation can only be remedied, if all the agencies concerned recognise the main purpose of the foot paths and exercise proper care in maintaining them in a good and attractive condition to encourage their use at all times. At locations, where the pedestrians are inclined to stray on to the carriageway, erection of railings to prevent them from doing so is indicated.

In the absence of defined locations for crossing of the road, there is likelihood of pedestrians doing so at all places, thus coming into conflict with the vehicular traffic. The provision of pedestrian crossings at suitable intervals, whilst adding to the safety of pedestrians, will also permit efficient movement of traffic between such crossings. It will also cause the drivers of vehicles to slow down at such points. In view of the inadequacy of such pedestrian crossings and also of their poor location, the orderly movement of pedestrians crossing the road is greatly hampered, and the respect due to them at such crossings is lost. An assessment of the need for them should be carefully made and they should be provided uniformily throughout urban areas so that people apreciate their benefits and their use becomes voluntary. Pedestrian crossings located in minor streets and along approaches to towns (where the chance of a pedestrian appearing on the carriageway by surprise, is greater) should be provided with a higher level of illumination than is the case today to encourage their proper use.

3.3.2.3. **Mixed traffic**

The problem of mixed traffic is associated with all cities and towns and it will be a number of years before the traffic can get homogeneous by the elimination of slow moving vehicles. At present, the management of this traffic either by the provision of adequate facilities for its segregation or by regulations cannot be said to be efficient. This has resulted in a situation where during peak hours undue congestion and traffic delays are caused to the irritation of all concerned. The high incidence of accidents in all the cities could be ascribed more to this cause than to any other. The co-existence of different types of traffic has to be made more healthy by inculcating a discipline among all road users. As has been pointed out elsewhere in this report, a prescribed set of rules for the drivers of all vehicles, as for motor vehicle drivers should be set down. A new line of approach to solve this problem is called for, to include the ear-marking of separate routes for different types of traffic, restricted operation of different vehicles at different times, and diversion of obsolete forms of transport to recreational areas or mofussil towns.

3.3.2.4. Traffic signals

During the last two decades, automatic electric traffic signals have been increasingly coming into use in many of our cities. While the designs and other requirements of these signals have been taken mostly from the U.K. and the U.S.A., uniformity in their installation and operation is still to be achieved. Unless their timings are based on actual traffic conditions during all hours of the day, there is a likelihood of violation of these signals, particularly when there are no policeman on duty. Hence, wherever there is a wide divergence between their timings and the traffic conditions, working of the signals should be turned on to flashing, to avoid any violations of the kind noticed and their inevitable consequences.

Moreover, set standards should be formulated for the location and operation of these signals, their components, their degree of illumination, as well as the types and sizes of their reflectors. To avoid the cost of an additional number of signal lamps, the right turn movement of vehicles is sometimes also permitted on the through green. Where such right turn movements are heavy, they will seriously interfere with the straight movement and where people are inconsiderate, they will result in collisions. In such cases, a leading or trailing right turn arrow should be used with the through green.

There is also need for a wider use of these signals on all roads to curb any tendency for the use of minor roads to avoid them.

3.3.2.5. Parking

Parking at the kerb has been the most common form of storage of vehicles along main roads. It narrows down the width of the road for their movement, thus creating congestion. Besides, the manoeuvres of parking and un-parking encroach upon the through moving lanes adding to the risk of accidents. In many locations, to gain more parking space, angular parking is resorted to which involves greater width of the roadway for parking and un-parking, thus increasing the interference to movement. The presence of parked vehicles on the road obscures the vision of pedestrians whilst entering them and increases the danger of their being run-over. Therefore, both from the point of view of safety as well as of efficient use of the road, off-street parking should be resorted to, either by separate lots or multi-storeyed garages in metropolitan areas, where the problem is acute.

In locating such facilities care should be taken to see that they have an easy access from the main roads and also that they are within reasonable walking distances from the destinations of the users thereof. An intermediate level of usage to meet the requirements of shoppers etc. could be arranged in some locations either by imposing time restrictions on parking or by resorting to parking meters. These arrangements should not, however, be made at the cost of through traffic.

3.3.2.6. **Loading and unloading**

Since the ultimate purpose of all trucks and buses is either the delivery and collection of goods or carriage of the travelling public, adequate arrangements have to be made for their parking. These parking places are known as loading and unloading zones for trucks or as bus stops. Deficiency in the regulation or location of these areas leads to indiscriminate use of the road sides, hindering traffic movement. With the expansion of our cities, this problem has increased so enormously that on several roads, safe movement is hardly possible even at crawling speeds Suggestions towards minimizing this handicap in the operation of trucks have been amplified under the Section on Truck Termini. Likewise, there is a case for a proper study being made of the location of bus stops, and, wherever possible, for the creation of lay byes on the roadsides, so that when the buses are stationary, they do not occupy the carriageway. Pedestrian crossings should be suitably located near such bus stops for safety of the passengers alighting from or boarding the buses.

3.3.2.7. **Cinemas, theatres and other major traffic generators**

Many establishments such as cinemas, theatres and super markets, result in a high volume of traffic on the access roads and nearby streets. If there is no margin for additional traffic on any road, such establishments should not be allowed in the vicinity of it. Since the power for granting permits for them is vested in persons who have no direct responsibility for traffic matters, they are likely to overlook this aspect of road safety. It is therefore suggested that wherever a scrutiny by the traffic authorities of the relevant applications is not currently being made, it should be made compulsory. It is also desirable that the promoters of such establishments should prepare a report indicating the impact of their projects on traffic conditions so that it gets fully examined. This arrangement will ensure better understanding between the public and the authorities and is, therefore, fully deserving of consideration.

3.3.2.8. Kerbs, channelising islands and medians

These features of urban roads are primarily safety-oriented, either separating different types or directions of traffic. Their dimension, shape, form and location have a large influence on the movement of traffic. Traffic engineering principles have enabled the formulation of standards in respect of all the above requirements. But in as much as many of our urban road construction agencies are not staffed at present by qualified traffic engineers, these requirements are not fully met.

3.3.2.8.1. Kerbs

Kerb stones of varying heights, shapes, and sizes, sometimes even with sharp edges are freely adopted. Excessive heights of kerbs keep drivers of fast moving vehicles away from them thus reducing the effective width of the roadway. On the other hand the use of low kerbs increases the hazard of vehicles straying over to the sidewalks, endangering pedestrians, a happening not too uncommon in our cities. Therefore, an optimum size would ensure efficiency of road use as well as safety of the foot-paths. Numerous type of kerb designs have been standardised by the British Standards Institution and by other agencies in the USA and elsewhere. An Indian standard should also be developed and publicised adequately for these kerb stones sc that their usage on scientific lines is encouraged and their current defects are corrected.

The colour of kerbs has an influence on their visibility. They should, therefore, be painted in a light colour or their surface be made of a reflecting type.

3.3.2.8.2. Channelising islands

These features built with kerbs in the area of the carriageway orient the traffic along lines of easy movement, so that the conflicting areas at road intersections are reduced. They enable "stop" positions of vehicles to be more easily determined. The shape and size of the channelising island apportioning the roadway to movement of traffic, should be based on proper traffic counts, so that the ease of movement is weighted higher for larger volumes of traffic in preference to lower ones. It is not an uncommon sight to see that, due to the poor location or improper shape of the island, vehicles do not follow the desired lines of movement, but foul the carriaegway too far from the island, to the detriment of smooth movement of the traffic along other lanes,

All channelising islands have to be provided with kerbs which are easily visible both during day and night and, where necessary, supplemented by proper illumination. A properly designed channelising island would not require many adjuncts like bollards for their identification, as they would not constitute abrupt obstructions.

Many times large areas enclosed in such islands are used for parking and often for other activities which encourage trespass by pedestrians and vehicles into the adjoining carriageways, much to the detriment of road safety for which they are intended. Where such multiple use of the channelising island is necessary in public interest, warning signs of the hazard involved should be put up much ahead of it, to alert the approaching traffic. The design and shape of channelising islands at the time they are planned, should take into consideration the speeds of turning manoeuvres in their vicinity. Trial and error methods are quite often adopted by using empty drums of asphalt and even rubble which, by the very nature of their form and appearance, fail to serve the purpose for which they are intended. Vehicles running over such features when they are not properly illuminated, are often involved in serious accidents. Hence they should be discarded.

3.3.2.8.3. Medians

Medians are separating strips which divide the carriageway for opposing directions of traffic obviating the possibility of head-on collisions. Roads on which they are located should be wide enough to ensure a smooth flow of traffic in either direction, without being too restrictive for parking and overtaking manoeuvres. Otherwise, conflicts arising from these requirements may even lead to a higher accident potential.

Where conditions permit, the medians should be as wide as possible, to help the elimination of glare by the head-lights of oncoming vehicles. In modern motorway designs, a minimum width of 9.25 metres is prescribed. Sometimes, the carriageways for opposing directions of traffic are separated by even arger widths.

The installation of a median necessitates openings for turning vehicles to be suitably located, so that the access requirements of the road are not adversely affected. The turning vehicles have quite often to stop and await gaps in the oncoming stream. If the roadway is not of adequate width, it will obstruct the movement of following vehicles. Therefore, the width of the median as well as the length of the gaps should be such as to permit stopping vehicles to so align themselves as to cause minimum obstruction to following traffic and at the same time to permit their crossing the oncoming stream of vehicles safely.

The illumination and shaping of the median towards exist points should follow the principles of "Kerbs' and "Channelising Islands", and these should be firmly adhered to, if medians are to serve their full purpose.

CHAPTER 4

ROLE OF DIFFERENT AGENCIES IN HIGHWAY SAFETY

4.1. Police Department

The work of traffic control rests primarily with the Police department in all the States. Till the beginning of the last War, motor vehicle administration, inclusive of vehicle registration, driver licensing etc., was looked after by them. It is only since the year 1939 that Motor Vehicles Departments have been created under separate Transport authorities, to take over the latter's functions. With a rapid increase in the volume of traffic all over the country, particularly in metropolitan and other cities, a separate branch of the Police has now been set up in most places under senior officers to look after traffic control. In some States like Maharashtra, where the volume of traffic along rural sections of the highways has also been steadily growing, a State Traffic Branch of the Police is functioning. In these cases, the traffic control work has become a full time job calling for a specialised skill. Wherever there is no separate branch set up for traffic control, it forms part of the other normal functions of the Police.

Highway safety education has been a fairly serious concern of the Traffic Control Police in metropolitan and other cities. They have special mobile squads in motor vans equipped with amplifiers to direct vehicular and other traffic through busy thorough-fares and road junctions there. In some cities they take interest in the education of school going children in road safety and help the school authorities in setting up road safety patrols. Safety weeks are also organised in big cities in collaboration with public organisations like the Automobile Associations, Safety First Associations, Rotary Clubs, Lions Clubs and the like.

One of the functions of this Branch of the Police is to maintain detailed information about road accidents. In recent years with the growth of public awareness for road safety, they are making a periodical analysis of the available data in this regard.

At some places they do this for the formulation of enforcement programmes by them.

Investigations into accidents are carried out by the personnel of local Police Stations, who are often not fully trained or equipped for an analysis of their causes. They have, for their objective, in most investigations, merely identification of the offender for the purpose of his prosecution. As such, in the final report on any particular case, all such contributory causes as the condition of the vehicle or of the road or of the driver, do not find mention in sufficient detail to form the basis for any corrective measures.

It was noticed that special accident investigation squads had been created in some cities, namely, Madras and Delhi for the investigation of fatal accidents. But unless such squads are properly equipped, besides being sufficiently skilled, and also engage in the investigation of all accidents, it will be difficult to utilise the data collected by them, to devise some positive steps for the prevention of accidents. A further point is that in most of the cities, the traffic police do not keep a continuous record of accidents or mark their locations on a map to identify the black spots and take suitable remedial measures.

In short, the role of the Police in the matter of road safety has been limited. Nor do they have any sustained programmes with adequate financial support for this purpose. The work is being carried out more or less haphazardly and there is still much leeway to be made up before highway safety becomes a major responsibility of this Department.

In future it will be definitely necessary for all States to emphasise the highway safety aspect of Police work. This has to be done by providing adequate personnel for it, apart from improving the quality of their training, equipping them suitably for better mobility and providing them with more sophisticated instruments for the detection of speeding etc. It will also be necessary to so organise their working with reference to road safety as to make it more expeditious and thorough.

The growth in traffic in recent years is fast vesting the road safety functions of the Police with an importance unknown in the past. In order that Government may realise the magnitude and urgency of the problem and devise measures for its effective solution, it is suggested that all Inspectors General of Police in their fortnightly report to their respective State

Governments, should include a paragraph giving a review of the road accident situation in their jurisdiction and of the road safety measures taken. There should be similar references made by the Chief Engineers of Public Works Departments and city Engineers, in their periodic reports to the State Governments or the Municipal Corporations concerned.

4.2. Motor Vehicles Department

This department is charged mainly with the responsibility of registration and control of all motor vehicles and the licensing of different classes of drivers. It has an important role to play in highway safety. By the standards it utilises for declaring the fitness of vehicle and the measures it takes for periodical check of their conditions or for the correct assessment of the quality and skill of all licensed drivers, it is supposed to ensure a traffic condition in which cases arising from the faults of drivers or from the defects of vehicles are minimised.

Logically, this role of theirs would necessitate their follow-up in close collaboration with the Police of the performance of drivers and vehicles, by keeping a systematic record of violations by them, specially in the case of accidents leading to a prosecution. Under the present conditions, mostly arising from the poor quality of records and the inadequacy of trained personnel or of equipment for the requisite follow-up action, such close collaboration leading to a positive programme for the prevention of accidents, is very much wanting. Only on public pressures developing, this Department initiates legislation in regard to new measures, such as the inspection of vehicles over a certain age.

This divided responsibility for the enforcement of traffic control by the Police on the one hand and for discharge of the functions enumerated above by the Motor Vehicle Department on the other, has been mentioned in some quarters as a cause for the present state of affairs. It is, therefore quite clear that a good deal of coordinated effort is necessary to make our roads safer all round.

4.3. Road Construction and Maintenance Agencies

The reponsibility for road planning, design, construction and maintenance is spread over a very large number of agencies in the country, namely, the Roads Wing of the Ministry of Shipping and Transport, the Military Engineering Service, the Central Public

Works Department, and the Border Roads Organisation, at the level of the Central Government, the Public Works Department (Buildings and Roads) at the State level, and the local bodies at lower levels. At present there is no direct responsibility fixed on these departments in the matter of road safety. They function under a general expectation of their responsibility for keeping the road fit for traffic and where the situation so demands, for warning the public of the danger ahead by suitable signs, markings and channelising islands. In some States, such as Himachal Pradesh, the Executive Engineer concerned or his nominee is required to join an investigation squad for the investigation of fatal and serious accidents within his jurisdiction, so that factors, if any, arising from the condition of the road at the scene of occurrence, are brought to light.

Under the present conditions, none of these departments are under an obligation to maintain a record of the road accidents that take place in their jurisdiction. Nor are they under any obligation to initiate any special programme for eliminating the causes thereof, particularly those arising from road conditions. They take steps in this direction only in particular cases, when their attention is drawn to them, by the Police or others. Actually, since road conditions affect the safety of all users of the road, it should be the primary responsibility of these departments to make a proper investigation of the flow of traffic and of the incidence of road accidents with a view to suitable preventive measures being taken. Since a vast number of variables, not easily identifiable by even a well qualified highway engineer and covering all the fields of planning, designing, construction and maintenance of highways, enter into the picture, the need has recently been felt even in countries like the United States of America and United Kingdom, for highway engineers being put through a special course of training, to enable them to identify such factors, and make the highways more safe for traffic. Hence the need for upgrading the relatively low standards of our highway engineering practice cannot be over-emphasised, if highway safety has to be improved.

4.4. **Municipalities and Corporations**

Being in charge of roads and streets in urban areas carrying a large volume of motor and other types of vehicles, these organisations are constantly pressed with demands for improvement of the existing road and street facilities and the provision of new ones. Since the problem of obtaining the requisite additional space in developed and built-up areas is difficult to resolve, owing to the large expenditure involved and also the rights of established usage, there is a shortage of road space, leading to congestion and difficulty of traffic movement in such areas. In large metropolitan areas, where these problems are of greater magnitude, effective traffic engineering remedies are required to supplement the enforcement measures for maintenance of a reasonable amount of safety in the movement of traffic. These engineering remedies are being tried by the authorities concerned only in a few cities like Bombay, Calcutta, Delhi and Madras. In smaller places, they have been left to be executed with the assistance of Government and non-Government agencies. The time is ripe when such facilities should be provided in all cities having a population of over 1,00,000. Besides discharging their responsibility for the construction and maintenance of roads, our Municipalities and Corporations have also the duty to control the unlawful activities of pedlars, hawkers and others indulging in wrongful use of the road space and its adjacent land, all of which run counter to the safe usage of roads. At present there is lack of adequate action or initiative on the part of both official and non-official agencies in this direction. What is worse, even though they realise the loss caused to the community by way of delays and accidents through mis-use of the road and road-sides, they are not prepared to run the risk of taking any initiative in the proper discharge of their duties. If the loss is evaluated properly and brought into a correct perspective, the influence of such vested interests as pressurise the public authorities into allowing the mis-use of road space, can be checked.

4.5. Town Planning Department

This department has an important role to play in the work of road safety because much of the character of traffic on highways is influenced by the types of land use created by its plans. For, both in the preparation of new plans and revision of the old ones, it can contribute to highway safety in full measure. Many of the planners seem to think that by adopting the required standards of road width and spacing of inter-sections alone, adequate safety can be ensured, which is not truly so. Of late, a large number of innovations in planning have revolutionised the thoughts of land use in relation to street types and locations. Some of these are the use of bigger land use divisions to reduce frequency of cross roads, elimination of frontage of properties and side walks along arterial routes and location of inter-zonal activities in the outskirts of the zones to eliminate through traffic from the interior roads. It would be necessary to follow these ideas ensuring the maximum highway safety. Not only are our town planning departments lacking in sufficient alertness in this direction but quite often they succumb to political pressure for maximum utilization of land area, in total disregard of highway safety. For the effective functioning of these departments, besides being safety minded at the time of preparation of the plans, they should be equally watchful that their original plans are not altered without thought at the time of re-development.

4.6. **Other Institutions and Organisations, Government and Private**

Another department of Government which has an important role to play in highway safety is that of Education. Through the introduction of highway safety lessons for different classes in schools, this department can educate the future generations in the proper use of the road, whether as pedestrians or as drivers. With increased affluence gradually making it possible in the future for more and more persons to own motor vehicles, the education department has the necessity of introducing even courses in driving as part of the basic education programme for children, as is being done in developed countries, like the United States of America. Apart from the Education department, organisations that are concerned with this work are various branches of the automobile trade, like vehicle manufacturers, oil companies, tyre manufacturers and manufacturers of ancillary equipment. These organisations participate indirectly in highway safety work, with a view to the promotion of travel which increases the quantum of their trade. They sponsor many activities such as the production of attractive literature, the organisation of Courtesy Weeks, and free vehicle inspections. But being trade-oriented these activities are not on a continuing basis and cannot be counted upon to support any sustained programme of adequate size for encouraging highway safety on the roads. They can only supplement efforts of the Government and the public. Road user groups like the Automobile Associations, the Transport Undertakings, the Safety First Associations, the Lions Clubs, the Rotary Clubs and the Junior Chambers of Commerce, can also play a big part by their efforts. The Road Safety Congresses which have given a fresh fillip to the highway safety movement in this country, have made a significant contribution in this regard.

Other organisations which can contribute effectively to the education of the public in highway safety matters, are the Press, the Advertising agencies, the Film industry and Television. A sustained message of highway safety can be very effectively transmitted through the methods by which they reach the public. These agencies have, however, been active only occasionally and that also at the instance of others in the course of their road safety programmes. They have themselves no spontaniety of interest and measures have yet to be taken to use the media of these agencies, for effective education of the public in highway safety matters.

CHAPTER 5

ACCIDENT RECORDS, THEIR COLLECTION AND ANALYSIS

5.1 Importance of Accident data

Accident records are the foundation for any analysis there of. The maintenance of accident records on a sound and uniform basis would be helpful for the following purposes:

(*i*) To identify accident locations and causes of accidents at these locations. [This information is useful (a) to traffic police authorities to enable them to take selective enforcement measures, i.e. enforcement at the time and place, where the accidents are known to occur, and (b) to highway engineers to enable them to improve road and traffic engineering features] ;

(*ii*) to maintain a record of drivers frequently involved in accidents to formulate better licensing and control measures ;

(*iii*) to work out other measures for the prevention of road accidents ; and

(*iv*) to evaluate the effects of various measures taken to prevent accidents.

The effective use of accident records, however, depends upon three factors, namely, accuracy of data, their proper maintenance and a thorough analysis of the data.

5.2 Methods of reporting the accidents

According to the present practice in the country, persons can report an accident at a police Station, either verbally or in writing or by telephone. The report can be lodged (i) by the complainant himself, (ii) by the driver involved in the accident, (iii) by a third party on hearsay, (iv) by the traffic man on duty and (v) by any other road user or passerby. It may also be given directly to the police control room in big cities.

In case any person is injured or any property of a third party is damaged as a result of a motor vehicle accident and if no police officer is present at the scene of occurrence, the driver of the vehicle or any other person in charge of it is required under Section 89 of the Motor Vehicles Act, 1939, to report the circumstances of the occurrence at the nearest Police Station as soon as possible and in any case, within twenty four hours of the occurrence.

5.3 Method of Collecting Accident Data

When an accident is reported, it is recorded at the Police Station and an officer is detailed for its investigation. Thereafter, the relevant information is sent to the Superintendent of Police concerned who maintains a statistical record of such cases.

In many States the data on road accidents are generally collected by the Traffic Police in Road Accident Form A-1. This form (Annexure 10) was suggested for adoption at the Fourth meeting of the Transport Advisory Council held in New Delhi in July, 1939. In case of fatal and severe injury accidents, the details are collected in this form but in case of light injury accidents or accidents involving slow moving vehicles or a mere collision type of accidents without causing any injuries, the details are recorded in the daily diary and afterwards transferred to the relevant registers or to Form A-1. In various States, the Police authorities prepare a summary of road accidents in Form-4 and send it to the Ministry of Transport for compilation. The first publication of "Basic Road Statistics of India" was brought out by the Ministry of Transport in 1949 and since then it is being published every year.

5.4 Deficiencies in Road Accident Form A-1

There are many deficiencies in Road Accident Form A-1 with the result that the details of road accidents supplied by the Traffic Police are insufficient for making a scientific investigation of them. There is no provision for a number of items of useful information, i.e. (i) exact location including geometrics of the road, (ii) type of traffic control at the site, (iii) details of second driver, if any, (iv) educational level of the drivers, (v) type of collision, and (vi) road user's reaction. A study of Form A-1 as filled up shows that in case of minor injury accidents and property damage accidents, about fifty per cent of the columns are left blank. In many cases, the cause of accident is written as "accidental" In the absence of a description and sketch, it is not possible to determine the type of collision and the fault.

5.5. Limitations of Road Accident Form-4

There are many deficiencies in Road Accident Form-4 (Annexure 11) also. Hence, the compilation done by the Ministry of Transport, does not cover all the aspects. Some of the deficiencies in the existing Form-4 are as follows :

(*i*) only the total number of accidents, irrespective of the severity, is given ;

(*ii*) the classification of the second vehicle, if any, involved in an accident is not given :

(*iii*) in more than fifty per cent accidents, the cause of accident is attributed to the fault of the driver. This fault should be specifically mentioned i.e. whether the accident occurred owing to overtaking dangerously, or reversing negligently, or cutting into traffic, or driving rashly.

(*iv*) in about fifty per cent cases, under some of the heads of details, all that is recorded is not stated ;

(*v*) details regarding age, sex, driving experience and the state of mind of the driver of the second vehicle involved in an accident, are not given ; and

(*vi*) the type of collision is not given.

5.6. Agencies Responsible for the Processing of Accident Information for Circulation of the Findings to Different Bodies

The police are the main agency dealing with the problem of road accidents. They analyse the data for cities, towns and highways and prepare an annual summary in Form-4 for transmission to the Ministry of Transport. In some big cities, they have their own Traffic Branch with a Research Bureau for this purpose.

Besides the Police Department, the Ministry of Transport does the compilation of accident statistics on an all-India basis. The statistical data in the publication 'Basic Road Statistics of India' deal, *inter alia,* with road and road transport, including growth of traffic, road expenditure, number of road accidents, number and type of persons killed and injured and various miscellaneous statistics, on an all-India basis. This publication also gives statistics on motor vehicles and accidents in a few foreign countries for the sake of comparison. There is much delay in obtaining road accident Form-4 from various States, with the result that the publication of 'Basic Road Statistics of

India' is out of date by two to three years. The 1969-70 edition of the above publication, however, does not contain statistics for motor vehicle accidents which have been brought out in a separate booklet entitled 'Motor Vehicle Accidents in India'

In some States the Public Works Department also collects the accident data. The Executive Engineer in charge of a particular road on which an accident takes place, sends its details to the Chief Engineer, Public Works Department, immediately after its occurrence.

In some hill areas, an accident enquiry committee does the spot inspection. All major injury accidents, in fact, are enquired into by the District Magistrate, the Superintendent of Police, the Executive Engineer and a representative of the Transport Department. Every accident involving injury to person or damage to property is reported to this Enquiry Committee. The information is said to reach the local Police Station the same day even in remote areas. In some hill areas the wireless system is made use of to report accidents involving buses run by Government.

In some cases Traffic Engineering Cells, attached to the Traffic Planning Unit of the State Public Works Department analyse, classify and interpret the accident data, apart from reviewing them monthly and bringing out a report.

The Central Road Research Institute, New Delhi and the Highway Research Station, Madras, analyse, every year, the road accident data of a few cities in India and various other countries for the sake of comparison. They also publish research papers and technical reports on road accidents.

5.7 Suggestions Received Towards Improvement of Collection and Analysis of Accident Data

Many suggestions were made to us by officials and non-officials in the country for improving the existing practice of collection and compilation of accident data and some of the important ones are given below :

5.7. 1. Since the Police Department is the main agency for investigating road accidents at present and for controlling traffic in Urban areas, it was suggested by the authorities in Uttar Pradesh, Haryana, Assam, Bihar, Rajasthan, West Bengal, Madhya Pradesh, Mysore and Maharashtra States that work regarding the collection of road accident statistics should remain with the District Police as hitherto. Uttar Pradesh, Bihar, Rajasthan, Madhya Pradesh and Haryana States further suggested that the Police Department should have a special statistical cell for maintaining the accident figures in each district of the State.

According to Haryana State, the cell should be manned by a Gazetted Officer having sufficient knowledge of traffic rules and regulations. Uttar Pradesh suggested that the personnel of the cell should be duly trained in the collection and analysis of road accident data and drawing proper conclusions from them, apart from making timely forecasts.

The Mysore State wanted the existing organisational set up to be augmented by a small band of traffic officers educated fully in the causes of accidents. In big cities, the data could profitably be analysed with the help of a computer.

According to the Gujarat State, there should be a special cadre of full time traffic officers who should specialise in this branch and whose knowledge and experience should be available to the Government. The Assam State suggested that the Traffic Branch should be expanded to meet its commitments adequately.

According to the Maharashtra State, a Research Bureau should be set up at the district level as well as State level to analyse the road accidents and to suggest ways and means of bringing them down. Trained Officers having an up-to-date knowledge of motor mechanism and having exprienece in driving for at least five years, should be appointed to look into such accidents and if sufficiently satisfactory reasons for prosecuting the drivers are available, action should be taken against them. Besides an increase in their number, the Traffic Police should have modern equipment and powerful automobiles. A formula for calculating the enforcement index by dividing the number of convictions and penalties by the number of accidents was also suggested by this State.

According to the Secretary Automobile Association of Southern India, Madras, it is due to lack of staff that the Police Authorities are not in a position to carry out meaningful investigation after an accident occurs. Investigations are carried out by unqualified, at times even uneducated constables, whose only aim is to see which of the drivers was at fault. They are not concerned with the cause of accidents. He suggested that, as is the case in Western countries, there must be a standing body, consisting of a police officer, a road engineer, a psychologist, a doctor and also an educationist, to go into the root causes of an accident so as to help in eradicating them.

At a meeting convened by us with officials of Delhi, it was suggested that whenever an accident takes place, besides the investigating officer who will confine his investigation to the immediate cause of it, a field investigator must also go to the accident spot, collect and analyse all available information having a bearing on it. His report, along with all other available data, should form the basis for a detailed study of measures to prevent accidents. A separate cell with field investigators and a full-fledged statistical section, should function under the Traffic department for this purpose.

According to the Inspector General of Police, Delhi, a statistical section should be created in every district and State to compile the accident data roadwise, vehicle-wise, day-wise, time-wise and police-station wise, of all road accidents in which persons have been killed or injured. Data should also be available regarding the causes of the accidents i.e. whether they were due to mechanical defect, fault of the drivers, lapses of other road users, defective condition of the road, drunkenness of drivers or other causes.

5.7.2. The Directorate of Transport, Delhi Administration, suggested that a full time statistical organisation for the collection and analysis of data relating to road accidents, road safety promotion, road engineering and enforcement, is vitally important. It should have scope and facility for research. This organisation should be linked with various Government and local organisations, including the Traffic Police, the transport Department, the State Transport Undertaking, the local municipal organisation, the Public Works Department and the Central Road Research Institute. It should be independent of control of the Superintendent of Police (Traffic) and placed under the control of the Director of Transport (or of the District Magistrate) so that its independent working is ensured.

For this purpose of collection and analysis of data relating to road accidents, Delhi should be divided into five zones and each zone should be headed by an officer not lower in rank than a Deputy Superintendent of Police. All the accidents occurring in the area of Police Stations falling in a particular zone should be reported to this zonal officer by the respective Police Stations. This agency need not be fully dependent on the Police reports and should be equipped with flying squads for collection of the requisite information on their own. A similar organisation should be set up in all the metropolitan cities.

5.7.3. According to Tamil Nadu, there should be a Traffic Engineering Cell attached to the Highway and Rural Works Department or a similar organisation in each State. It should be headed by a Divisional Engineer and have Assistant Engineers, Junior Engineers and Research Assistants for collecting and compiling traffic accident statistics on the roads under their jurisdiction. The same set up can take up the study of traffic accidents of the districts as well, by having additional personnel.

The Assam Public Works Department suggested that a traffic-*cum*-accident cell should be created under the Public Works Department for the collection of road accident data, analysing the causes thereof, and suggesting suitable remedial measures.

There was a suggestion by the Kerala Public Works Department that there should be a Traffic Co-ordination Committee in which representatives of drivers, conductors, students and passengers should be included. The decisions taken in the Committee should be properly implemented.

5.7.4. One of the suggestions made to us at a meeting in Delhi was that traffic cells should be set up in all the metropolitan cities to suggest suitable measures. A Traffic Research Supervisory Committee consisting of a representative of the Automobile Association, the Traffic Police, the Municipal Corporation, the Transport Department and other concerned authorities should be constituted under the chairmanship of the Secretary of State Transport Department to supervise the cells.

5.7.5. All these suggestions have been duly considered by us and our recommendations covering them are contained in Section 6.13.

CHAPTER 6

Suggested Remedial Measures

6.1. Driver Licensing and Control

6.1.1. Age limit for Drivers

The Motor Vehicles Act lays down that an applicant for a licence to drive a motor vehicle other than a transport vehicle must be at least 18 years of age. In the case of a person who wishes to drive a transport vehicle, he must not be less than 20 year of age.

There is need for having a minimum age limit as unlike other road users the drivers of motor vehicles shoulder a greater responsibility. They man automobiles that are powerful and capable of speeds necessitating careful manoeuvring and control. The driving of such vehicles calls for caution and presence of mind, apart from a due sense of responsibility; qualities that are essential, if their drivers are not to endanger both themselves and others on the road. And these qualities which contribute to the safe and free flow of traffic are normally developed in a person by the time he reaches 18 years.

A question that is often asked is why there is no similar maximum age limit for drivers of other types of vehicles using the public roads. Animal drawn vehicles and push bikes being slower and less powerful can be controlled easily and do not call for the same degree of care and caution. However, the irresponsible manner in which some of these drivers use the road quite often result in serious accidents involving automobiles. It is, therefore, worth consideration if in the interest of road safety there should not be some age restrictions for such drivers, at least until such time as a segregation of automobile from slow moving traffic is brought about. Our own view is that children below 12 years of age should not be allowed to ride a bicycle or drive any vehicle on public roads in municipal areas.

6.1.2. Minimum Standard of Education.

Applicants for driving licences must satisfy the authorities that they are physically fit and competent to drive before they are issued to them.

A factor that has a bearing on the quality of driving is the mental make up of the driver which to a considerable extent is influenced by his ability to understand and appreciate the Traffic Rules and Regulations. A driver who is illiterate can neither go through the rules nor read road and traffic signs. This is of great significance in these days when the operation of motor vehicles is not confined to a single region or State but embraces several States. The relaxation of restrictions on the movement of motor vehicles makes it all the more important that the driver should possess a minimum educational background to enable him to follow the rules. Without such a background the driving tends to be careless and irresponsible as well as dangerous.

In these days with a huge population of the educated unemployed, the imposition of a minimum educational qualification for drivers is not lilkely to lead to a dearth of drivers. On the other hand, such a step will contribute to a raising of the standard of driving and, at the same time, offer a practical solution to the problem of the educated unemployed. It will improve the standard of driving by attracting to the profession people more amenable to traffic discipline.

By a minimum standard of education is not meant that the applicant for a licence should have completed his high school education. Higher educational qualifications will be an asset, but the purpose will be served if aspirants for driving licences can produce a certificate of having passed at least the V standard.

6.1.3. Driving Test

There is a wide feeling that the existing procedure for the issue of Driving Licences after the prescribed tests, is not sufficiently rigorous. As a result, it is said, a good number of persons join the ranks of motor vehicle drivers every year without being adequately equipped for their work. Either the physical fitness of the person is below par or he is lacking in driving skill and knowledge of the traffic rules. One way to overcome these lapses would be to tighten the rules pertaining to the driving tests and to see that no one is issued with a driving licence unless he has undergone successfully a course of training in a recognised driving school for a specified period, which ordinarily should extend to a minimum of six weeks. Since the introduction of a programme of driver training exclusively through driving schools is likely to take a few years, it is suggested in the first phase that this requirement be made compulsory for professional drivers only. Simultaneously, attempts should be made to raise the standard of training available in these schools. Wherever possible the Government itself should run such schools so that the profit making motive alone does not encourage the admission of trainees beyond their capacity. The standard of training in these schools depends mostly on the calibre of their instructors. Efforts should, therefore, be made to ensure that the schools provide themselves with experienced and qualified instructors who are not only skilled drivers but are also well-versed in teaching traffic rules and regulations, besides having a knowledge of motor mechanism and maintenance. In this way alone will they be able to impart a sense of defensive and sportsmanlike driving to all the trainees.

The road test prescribed by the Motor Vehicles Act is for all practical purposes the only test given at present to the applicants for driving licences. A pass in this test does not give a correct indication of one's driving skill. In the first place, no common standard is used for the test and secondly, it does not provide for complex situations which call for correct and quick judgement on the part of the driver. It has, therefore, to be substituted by an objective type of test on a standardised basis, allowing for a closer observation of the drivers behaviour. It must embrace in its scope a sizing up of human personality in its physical and psychological aspects. The testing procedure should be phased. The determination of the physical capability of a driver should be followed by Reaction Time Test. The normal reaction time of a good driver is three-fourths of a second, during which time a vehicle driven at 50 Kms. per hour will have covered about 11 metres, before it can be brought to a halt. But this time also will vary in direct proportion to the physical and mental make up of a driver.

6.1.4. Vision and Hearing

The rear view mirror gives the driver an idea of the traffic coming from behind but it is not adequate. So, the driver must be tested to judge his ability to attend to sound and light emerging from behind. The human eye can operate within a range of 180°. The driver should be capable of receiving and reacting to movements within this range.

Distance perception which relates one's own speed to that of other vehicles and co-ordinates the time factor involved in overtaking or crossing one another, is connected with sight and hearing. Tests to measure this will enable the examiner to decide if an applicant for a licence can safely deal with situations in which the overtaking of, or yielding the right of way to, another vehicle or even compliance with the road signals is involved.

6.1.5. Mental Faculty

The applicant should also be examined to adjudge his ability to anticipate the relative size of a near and distant object, which will be useful to him in negotiating corners, intersections and round-abouts.

6.1.6. Night Driving

A frequent cause of accidents at night is the glare caused by on coming vehicles which momentarily blinds the driver's vision. It takes three to eight seconds for a person with good eyesight to recover from the glare and during this time the vehicle will have covered a long distance in utter darkness and it will be sheer luck if it escapes an accident. A glare recovery test should be carried out to gauge the applicant's ability in this direction, followed by tests pertaining to colour and night blindness.

6.1.7. Theoretical Test

There should be an oral or written test, preferably both, to determine the applicant's knowledge and awareness of road signs, road signals, road markings, common traffic rules, basic knowledge of motor mechanism and the safety factors. The applicant should know the fundamentals of car control, steering, tyres, reaction time and braking distance, before he is declared fit to hold a driving licence.

6.1.8. The Practical or the Road Test

The practical or the road test is designed to indicate the competence or otherwise of a person to drive a motor vehicle on a public thoroughfare. Being the most important part of the examination of an applicant for a driving licence it should be conducted over a period of time and a length of road sufficient to bring out the driving skill and knowledge of the applicant under varying traffic and road conditions. The minimum standards of

Driver Licence Examination of the American Association of Motor Vehicle Administrators lay down that the course for the practical test should be not less than 2.50 kilometers in length and contain enough features for a test of from 12 to 15 minutes duration. On the other hand, the Drafting Manual issued by the Ministry of Transport, Great Britain, contemplates a test lasting 30 minutes. Looking to the complexities of traffic conditions in our country and the deteriorating position in the matter of road accidents, we feel that the duration of the tests here should be from 25 to 30 minutes.

As regards the actual test itself, Part I of the Test of Competence to Drive, contained in the Third Schedule of the Motor Vehicles Act, 1939 as amended to date, is reasonably exhaustive. We would, however, suggest inclusion of the following aspects in the list of requirements to be complied with :

(i) That the applicant takes suitable precautions before starting the engine *i.e.* makes sure that the hand brake is on and the gear lever is neutral.

(ii) He keeps well to the left in normal driving *i.e.* except when wanting to turn to the right, overtake or pass parked vehicles.

(iii) He keeps to his appropriate lane.

(iv) He makes proper use of the rear view mirror well before signalling/changing direction/overtaking/stoppings.

(v) He shows alertness in anticipation of the actions of cyclists, pedestrians and drivers and allows adequate clearance to them.

(vi) He acts properly at cross roads or road junctions and respects pedestrians crossings.

The application form for obtaining driving licence should contain a page listing the items specified in the test of competence to drive, against each of which the testing officer should put a tick or a cross, to indicate a pass or a failure, as the case may be. If applicant does not pass the test, he should be furnished with a statement indicating his shortcomings.

As in Great Britain, the Ministry of Transport should bring out a driving manual by way of a guidance for all those who take driving seriously. The publication should be priced low and made available in Hindi, English and the State languages.

6.1.9 Provisional Licence

After satisfactory completion of the above driving test, an applicant for a driving licence should be issued a provisional licence valid for three years. This is necessary because, ordinarily, a driver does not come to the notice of the enforcement authority untill he is caught committing a traffic offence. What is indicated, therefore, is that a record of his performance as a driver should be maintained and if during this period he is involved in a serious accident and convicted for rash driving, his licence should be revoked and he should be given a fresh provisional licence only on his passing a fresh test. If he has a clean record, the provisional licence should get confirmed and he should be eligible to have it renewed under the normal rules.

6.1.10. Attested Photograph in Driving Licence

Along with the centralisation of licence particulars, it should be made obligatory that attested photographs of the applicants together with their signatures should be affixed to their driving licences. This would not only prevent impersonation, but also help verification when applications for duplicate or fresh licenses are received.

6.1.11. Competence Certificate and Driving Licence

Enforcement authorities have currently the responsibility for follow-up of traffic violators. But under the present system, they are compelled to approach the licensing authority to obtain their address and other particulars. It is further alleged that the present method of issue of driving licences does not provide for a satisfactory scrutiny of the status and character of the applicants, before this is done. Some times this has led to undesirable persons operating the vehicles for unsocial activities such as smuggling, dacoity, thefts, etc.

Therefore, it is felt that processing for the issue of a driving licence should be done in two stages; namely, that the applicant should first obtain a competence certificate of driving from the Transport authorities who are sufficiently equipped for taking the driving test. He should then present it to the Police authorities who would issue the driving licence after such verification as may be called for. The renewal of a driving licence should also be done by the Police who in the case of poor performance of the person concerned as revealed from his records, may refer him to the Transport authorities for a repeat driving test, and after receiving a fresh competence certificate, can renew the licence to him.

6.1.12. Licensing Drivers of Motor cycles and Scooters

Motor Cyclists/Scooterists holding learner licence drive on the main roads although they are not authorised to drive on their own. This is risky and should be prevented. They should learn their driving only in open grounds and bylanes instead of along main roads.

6.1.13. A points system for motor drivers

This system provides a progressive record of lapses in the behaviour of a motor driver by way of violations of motor vehicle regulations resulting in accident, apart from a record of his court convictions or the warnings given to him. It has recently been adopted by the Traffic Control Authorities in Bombay.

The right to operate a motor vehicle is not one of the inalienable rights guaranteed by the Constitution. It is at best only a privilege of the citizen. If it were a legal right no licence would be necessary. Before this privilege is granted, the person receiving it must demonstrate that he has the necessary intelligence and physical ability to be worthy of it. If at any time thereafter either of these qualifications is lacking, the authorities must have the power to suspend or revoke it. This process helps to deal with the licensed drivers who do not know how to behave safely or simply do not do so. For these powers to be effective, the authorities have need to do many things, including suspension or revocation of licences issued to bad drivers.

The point system works on the premise, "That violation of motor vehicle rules is symptom of an accident to come". By keeping a record of all drivers within a jurisdiction, the system collects information of all convictions in Courts, Police reports or warnings relating to the driver, in and outside the jurisdiction. The system of assessment of points usually adopted, is that for each of the above lapses a point is scored and that as soon as a minimum mumber of points is reached, a warning is sent to the driver concerned, along with a record of his lapses. Also, to keep the driver informed of the progressive score, it should be conveyed to him in the notice of each violation. In case this proves fruitless, then the driver is called up and interrogated. Should this also have no effect and the driver be found having exceeded the maximum number of points, then the final step of either suspension of his licence over a limited period or permanently, (depending upon the nature of the accidents and violations in which he is involved), is taken.

It is recognised that in the working of this system the power that is vested in the authority concerned is meant to be used with discretion, so as to ensure that equal and just treatment is meted out to all licence holders. A certain amount of flexibility should be incorporated in the point system, so that, as the need arises, its scale may be open to revision. Definite statutes covering the point system would have the disadvantage of setting down a law that would tie the authorities' hands and debar them from a consideration of the peculiarities of individual cases.

The system merits consideration, to start with, in the large metropolitan areas of the country where organisations already exist for traffic enforcement programmes and also where the need for improvement of drivers is most urgent. There are numerous details about the methods of evaluation of different types of violations and accidents in the system and after a careful study of its working in a few places, one that is found most advantageous to suit the prevailing conditions might be adopted as an experimental measure and progressively improved upon.

6.1.14. Drunken Drivers

Drunkenness is one of the causes of accidents but under the existing law it is hardly possible to obtain the conviction of a person driving a motor vehicle under the influence of alcohol or drugs. At present, the driver can refuse to undergo a test to determine the degree of his drunkenness as the law protects him from giving evidence, or being a witness, against himself. Furthermore, the law does not lay down a limit of alcohol content in the blood beyond which anyone will be deemed to be unfit for driving. It is, therefore, imperative to take some measures to control this. The following are some suggestions in this direction:

(i) Instead of the opinion of any officer regarding the drunkenness of a driver, a limit of blood-alcohol content of 0.05 per cent should be fixed. In case this limit is exceeded, the driver should be deemed as drunk, whether or not he has committed any other offence. The law should also provide that a driver suspected of having taken alcohol can be compelled to undergo a medical test or else forego his driving licence;

(ii) If a driver is found having taken alcohol in excess of the specified limit, action should be taken against him by way of an endorsement in his licence, Court fine, revocation of licence, as may be necessary, depending upon whether it is his first or repeated offence;

(iii) Steps should be taken to ensure that the drivers whose licences have been suspended, do not obtain duplicate or fresh ones, by unfair means; and

(iv) In order to enable the Police authorities to launch a determined drive against drunken drivers, large-scale manufacture of an equipment similar to an alcohol meter of baloon type and its distribution among the Police Officers, throughout the country should be taken up.

6.1.15. Renewal of Licences

At present the renewal of Motor Driving Licences has become a routine process every three years. The procedure followed does not take into account the physical and mental changes that take place with the lapse of years in an individual which are bound to affect his driving ability. It is, therefore, necessary that there should be a periodic test carried out of the driver's skill in driving and physical fitness to drive, say, once in six years or more frequently. If at the time when the driver qualified for a licence, he wore glasses or used hearing aids or other devices, the driving licence must be made conditional on the use of such aids by the holder of the licence while driving.

6.1.16. De Luxe Driving Licence

The Licensing and Traffic Control Authorities can promote good and safe driving by encouraging those who are careful drivers. One way of doing this would be to draw a line between those who are accident free and those who are not so. The simplest way of separating good from bad drivers is to differentiate the get up and form of the Driving Licence. While the ordinary driver would have to be content with the usual Driving Licence, one with a clean record for a continuous period of six years could be issued a De Luxe Licence which he will forfeit the moment he gets involved and convicted in an accident. Such a distinction will make a person take pride in his driving and preserve untarnished his De Luxe Licence.

6.1.17. **National Driver Register**

In the case of all drivers of motor vehicles who have been involved in serious traffic violations or accidents resulting in Court convictions, such information should be recorded in a National Driver Register. The Register should be a voluntary and co-operative State and Central "driver-record" Exchange, designed to serve as a national clearing house for records of drivers convicted of serious offences. This would help verification by the authorities of all States from a central source, of the nature of previous records of applicants for Driving Licences. In the absence of such an arrangement, no verification of earlier records will be possible.

The National Driver Register will support and complement State reciprocity and driver-record exchange arrangements which can be effective only when the drivers' home State is known. If the Driver Register has a record on the applicant, a report can be sent to the enquiring State, with a copy to the State which originated the record on the driver. In this way the two States interested in the driver's record can communicate with each other for the purpose of obtaining further information on him. If other States are involved in the issue of licences to the driver, they also can be sent copies of the Driver Register reports. Any number of States can in this way construct common reference files on a given driver. A nation-wide check would effectively hinder the driver from attempting to evade the consequences of his driving record, by moving from State to State.

Apart from enabling a check of the applicant's record, a number of other purposes can be served by the States making maximum use of the National Drivers' Register. Licences can be refused to those applicants whose out-of-State record warrants further investigation. Drivers can be called for interview and made to undergo a refresher course. Revocation and suspension of driving privileges can also be ordered. Drivers who have clearly made any mis-representation about themselves can be prosecuted. Last but not the least, Courts can be supplied with out-of-State driver records for consideration in awarding sentences. The Register will also enable repeat offenders being dealt with adequately.

The employment of computer techniques for maintaining records of drivers will enable enquiries about applicants for driving licences being dealt with promptly.

6.2. UNIFORM TRAFFIC LAWS AND MODEL REGULATIONS

6.2.1. Uniform Traffic Laws

At present, the control of traffic along the highways and streets in the country is based on the provisions of the Motor Vehicles Act, 1939, as amended from time to time and the rules thereunder as framed in different States to suit local conditions. In view of the variations in these rules from place to place, most road users do not have a clear conception of their relative obligations. In addition, with powers vested in the States in regard to requirements of the weight and size of a vehicle, they vary from State to State, leading to a wide range in the types of bodies in use and their safety requirements, which are not conducive to safe driving on all roads in the country. Besides, many of the standards of the vehicles remain unspecified. What is more, the composition of the traffic is so mixed and the regulations controlling it so inadequate that safety on the road is much jeopardised. Hence, there is an urgent need to examine all the regulations framed in the country and arrive at basic uniform traffic laws, along with supplementary model traffic regulations applicable to the control of traffic in municipal areas. They have to be kept constantly under review concurrently with changes in the road design, or of types of traffic. Care has also to be taken to see that no type of traffic is handicapped beyond what is necessitated in common interest. Provisions for the rights and duties of pedestrians, for the operation of bicycles and other vehicles like cycle and auto rickshaws, bullock and other animal drawn carts, are also necessary. The urgency for evolving uniform traffic laws is, therefore, very obvious, if safety programmes applicable to all road users, are to be based on a sound footing. Other factors which emphasise the early need for these basic uniform traffic laws in the country, are the growth of inter-State traffic of cars, buses and trucks in recent years (of which the number is likely to go up still more with the encouragement now given to tourism in the country) and the increasing demand for a large part of commercial freight and passenger traffic being carried on the main highways.

6.2.2. Model Traffic Regulations

The model traffic regulations are intended to be an extension of the basic uniform traffic laws with special reference to the application of traffic control to urban areas. They should enumerate duties of the Police Department in the enforcement of all traffic laws and provide that motor vehicle accidents are to be investigated and records of traffic violations and accidents maintained. They should also define the functions of the engineer-in-charge of traffic in a city in respect of installation of traffic control devices, including traffic signals, the establishment of special speed zones, control of the turning movement by signs and markings, designation of one-way streets, through streets, or stop inter-sections and the formulation of regulations in respect of over-taking and passing of tram cars, if any.

Among other things sought to be covered by these regulations are such matters as the right of way of pedestrians in cross walks, their limitations in other parts of the roadways, their compliance with the traffic control signals and other requirements. In addition they should cover numerous provisions relating to the method of parking and to places where stopping, standing or parking is prohibited, apart from specifying kerb loading zones for other freight or passenger vehicles and stands for buses, taxi cabs and other vehicles. Regulations for the movement of bicycles and all transport other than motor vehicles should also find a place in them along with a mention of the typical traffic violations in urban areas and of the fines and other punitive measures entailed by them.

By covering the total requirements of safe management of traffic in urban areas, they will guide the authorities not only in instituting precise steps for enforcement of various regulatory measures, but also in the handling of violations so that the safety programmes are made effective.

6.2.3. The citizens' version of basic uniform traffic laws and model traffic regulations

These are essentially guidelines defining the powers of the authorities in regard to the adoption of various measures towards traffic control and road safety. These also set forth procedures for the implementation thereof and the penalties for violations—wilful or otherwise, by the public. Since no law can be of much practical use, unless it is self enforcing for a majority of the public, efforts are called for on the part of the authorities promulgating it, to set down the provisions in the form of a Highway Code easily understood by the public. In the case of traffic matters in which a countless number of requirements have to be met automatically, this is all the more necessary, especially when there is so much of illiteracy in the country. One thing that could be done towards this end is to press into service all the methods of publicity through pictorial representations, local language versions, posters, hoardings and the like.

6.3. Judicial Processes and Traffic Courts

In the drive for Road Safety, an intelligent and strict enforcement of the traffic rules and regulations has an important place. The traffic laws are designed to ensure control over all persons,—drivers as well as pedestrians using the road. A sure and consistent application of corrective measures will generate the required feeling for future obedience to the traffic laws. On the other hand, failure of any enforcement agency to apply the desirable enforcement techniques, reduces their ultimate effectiveness. The enforcement machinery must be geared upto, and maintained at, a high level of efficiency, if road users are to respect the traffic laws and give them their implicit obedience.

6.3.1. Limitations in the present system

During our visits to the various States, it was brought to our notice that the work of enforcement is greatly handicapped; first, by the delays in judicial procedures involved in Court prosecutions and, secondly, by the light punishments meted out. In the event of a traffic offence being detected, the Police ascertain the name and address of the owner of the vehicle concerned and then obtain from him particulars of the person in charge of it at the time of the offence, to enable further action to be taken. Thereafter, a case is filed in Court and once the matter is before it, Court processes such as serving of summons and examination of witnesses, adjournments and postponements, arguments and counter arguments and so on, must take their own time, before which the ordinary citizen, no less the authorities, are helpless.

Evidence has been tendered before us that the efforts and enthusiasm of the Traffic Police in detecting and "challaning" traffic offenders get blunted owing to the inability of the Courts to ensure prompt disposal of the cases. In Gujarat, we were told, thousands of traffic cases are pending with the Courts. One cannot expect this work load even to level off in the near future.

because of the inevitable increase in the number of vehicles and drivers.

The citizens' attitude towards the enforcement of traffic laws, towards the judiciary and in no small degree, towards Government itself is likely to be moulded to a great extent by the manner in which justice is meted out. If the impression left on his mind is unfavourable, the result is disrespect of the traffic laws and this may generate a chain reaction that will destroy effectiveness of all activities connected with traffic safety. On the other hand, if it is favourable, it will mean an inevitable recognition of the proper function of Traffic Courts in accident prevention.

Most of the Courts which try traffic cases, at present, also hear other types of cases. As such the work load they carry is too heavy for them. A traffic case may come up before Magistrate who has no practical knowledge of traffic problems. Yet, he is expected to disentangle the facts and pass an impartial judgement on it even if he knows nothing but what he is told, probably by prejudiced witnesses. Only recently Mr. Justice Vimadalal of the Bombay High Court made the observation, (reported at page 362 of 1970 Accident Claims Journal) that the Chief Presidency Magistrate should see that accident cases are tried only by Magistrates who know driving.

6.3.2. **Traffic Courts**

There is an increasing volume of opinion, with which we agree favouring the constitution of separate Traffic Courts to try traffic and accident cases, composed of Magistrates with a working knowledge of the automobile and a driving experience of at least five years. Such Courts, by inflicting the proper punishment on the offenders can secure a country-wide impact on potential violators and their future driving attitude. Mere provision of Traffic Court is not enough. They should be provided with requisite staff and other facilities.

Because of the increasing toll of highway accidents, trial Courts at first instance should require all persons charged with "moving violations" to appear in person. They should devote sufficient time to each case for the purpose of assessing adequate corrective penalties.

These innovations will call for an increase in the Court personnel, but the expenses should not be grudged as the objective is the creation of a better traffic safety environment.

The Traffic Courts should be manned by full time and not part-time Magistrates. Part-time Magistrates cannot devote enough time to each case, as they have other work to do.

The Courts trying traffic offences would benefit if trained Traffic Prosecutors are assigned to them for dealing with violation cases. Their training and experience will come handy for this purpose.

Delay in the institution of proceedings results in miscarriage of justice. Memory fails due to lapse of time and material evidence necessary for dispensation of justice is often not available. Persons who witness accidents are not inclined to give evidence, as it would entail frequent Court attendance and loss of valuable time which they can ill afford. Traffic Courts should arrange to record the evidence deposed by the witnesses on the very day they appear before them.

It is not unusual for the time of Courts being wasted by defendants who employ delaying tactics. Such tactics can be met if the Traffic Courts are given summary power and provision is made in the Motor Vehicles Act for the right of only one appeal against their verdicts.

It is also necessary that the violation record of each person should be readily available to the Court so that it can deal suitably with repeat offenders. In its absence such violators are let off lightly, as the Courts are prone to treat them as first offenders. In the event of there being a Central Licence Record Office, the Courts could give directions for a copy of the order of conviction being sent to that Office, to ensure the completeness of its records.

The work load on the Traffic Courts could be considerably reduced, if the summons from a Court offers the accused an option to plead guilty by a registered letter addressed to the Court and to remit to it such sum as may be specified therein, instead of having to appear before it. Such a procedure is prevalent in Bombay and Delhi and it is recommended that this practice should be extended to all the States.

6.3.3. Special Police Staff

There should be accident investigating squads consisting of high ranking officers conversant with the traffic laws and regulations, to scrutinise the facts of each accident reported and to order proceedings only against those to whom the blame could be rightly attributed. Such a procedure would obviate allegations of corruption against the investigating staff and the harassment of innocent road users.

At places where such squads are not functioning each Police Circle/Division, especially in urban areas where there is a fairly heavy volume of motor traffic, should have at least one Traffic Inspector conversant with the traffic laws and rules. He should be competent after scrutinising the statements deposed by the witnesses and examining the track marks, the position of the vehicle, the nature of the road and the extent of the injury or damages sustained, to judge who should be primarily held responsible for an incident. This would eliminate unnecessary cases being brought before the Courts, without proper consideration of the facts and thus lessen the strain on them.

6.3.4. Mobile Traffic Courts

Cases of traffic violations are mounting up day by day. The rate of disposal of such cases, compared with the number of offences booked by the traffic police every day is very slow. For various reasons it takes months before a person is actually penalised for the offences committed by him. For quick disposal of cases, there is a growing opinion in favour of the institution of Mobile Traffic Courts.

Mobile Court Magistrates deployed on duty at various points in the cities dispose of cases brought before them during their rounds. They punish traffic offenders and dispense justice on the spot. Such Courts bring about effective enforcement of Traffic Regulations and also ensure that the erring offenders are brought to book immediately. The scheme eliminates the procedure of serving challans for petty offences and of securing the presence of the accused before the Court on a given date and thus saves delay in meting out justice. In a way it also minimises the work load on the regular Courts, as it leaves them free to hear more important traffic offences, while it is concerned with the minor ones.

The introduction and operation of Mobile Courts, assisted by a force of Mobile Police Traffic Patrols will have a wholesome effect on petty traffic violations, as they will serve as a corrective for them. Mobile Traffic Patrols supported by Mobile Courts being on the look out for erring road users, the latter will have very little chance of committing offences on the sly and getting away with them.

Mobile Traffic Courts were found to be functioning in the States of Tamil Nadu, Rajasthan, Delhi, as well as Jammu & Kashmir, and, according to the Traffic Control authorities in these States, they had proved to be useful. Since the experience gained on the working of these Courts in the States mentioned, has been encouraging, there is a case for extending the scheme to other States.

6.3.5. Minimum Punishment for Traffic Offences

To meet with the prevailing strong feeling that the punishment meted out for traffic violation is not adequate to correct the behaviour of offenders, in our opinion there is a need for prescribing in addition to a maximum punishment, a minimum punishment also in the case of all endorsable offences mentioned in the Fifth Schedule of the Motor Vehicles Act of 1939. This step will bring a higher uniformity in the treatment of offenders and it is suggested that the minimum should be at least 50 per cent of what is prescribed for the maximum in the above Schedule.

6.4. MOTOR VEHICLE INSPECTION

6.4.1. Vehicle Defects

The condition of the motor vehicle is an important factor affecting road safety. It is particularly so now, when we have on our roads quite a number of vehicles over ten years old from the date of their registration. The older the vehicles, the greater the wear and tear and the lesser their road worthiness. This need cause no surprise when there is a lot of complaints even in respect of new vehicles manufactured in the country. The quality of replacement parts locally manufactured, it is said, is below standard and contributes to a good number of vehicle breakdowns and accidents.

Authentic statistical data to indicate accidents caused by the poor condition of the vehicle are not available. But from the evidence recorded, it is clear that vehicle defects are no less responsible for accidents than bad driving and indifferent enforcement by the authorities. Even in an advanced country like the

U.S.A., the National Safety Council attributes a good number of fatal accidents to vehicle defects.

The most common defects which cause accidents are inefficient brakes, worn out tyres, bad steering, electrical disorders, non-functioning of the horn, the windshield wipers and the signals and the lack of proper maintenance.

These defects make the vehicle unroad-worthy, As the majority of drivers are ignorant of the mechanism and functioning of their vehicles, the defects remain unnoticed until they result in a breakdown or an accident to the vehicle.

6.4.2. **Periodic Inspection**

Since the road worthiness of the vehicle and its proper up keep are important from the point of view of accident prevention, there should be a periodic inspection of its mechanical condition at fixed intervals, so that the defects that develop in the intervening period can be attended to in time. Such an inspection should embrace all types of automobiles on the road and those found unfit should be weeded out, if within a specified time they are not made road worthy.

In addition to the essential mechanical equipment the following items should be checked at the periodical inspection :

(i) Registration number plates.

(ii) Registration certificate.

(iii) Insurance Certificate.

Chapter V of the Motor Vehicles Act deals with the construction, equipment and maintenance of motor vehicles. The compulsory inspection should be carried out against the background of the requirements of this Chapter and the rules formulated thereunder.

6.4.3. **Fitness Tokens**

In the same way as tax tokens are now displayed, the fitness tokens issued for vehicles after inspection should be exhibited suitably on the windscreen indicating their date of expiry, to facilitate surprise checks on the road. The inspection of vehicles and the display of fitness discs should be made compulsory to prevent vehicles in an unsafe condition from operating on the road.

6.4.4. **Transport Motor Vehicles**

At present transport motor vehicles such as taxis, buses and trucks must have valid fitness certificates without which they cannot operate. In the case of a bus or a truck in Maharashtra State, for instance, the fitness certificate is issued for six months to two years, depending on its condition, while for a taxi the certificate of mechanical fitness is valid for a year. The inspection must cover the compulsory equipments, such as the bulb horns, the windshield wipers, the rear view mirror (external), the brakes (foot and hand), the steering connections and the suspension.

6.4.5. **Non-Transport Motor Vehicles**

In the case of non-transport vehicles like motor cars and motor cycles, there is no compulsory periodic inspection of their mechanical condition at fixed intervals. There is, of course, an inspection at the time of registration, but thereafter, such a compulsory inspection is carried out only when the vehicle is involved in a major accident or when it is to be assigned a new registration mark or when transfer of its ownership is to be effected. The compulsory equipments that are inspected are the windshield wiper, the rear view mirror (internal), the speedometer, the steering connections, the foot and hand brakes, the front and rear suspensions, the side indicators by mechanical or electrical device, the clutch, the gear loop point and the upholstery. If the vehicle is a left hand drive one, then a caution board 'Left hand drive' is needed at the rear of the vehicle.

Recently in the Maharashtra State, it has been made compulsory for motor cars after twenty years from the date of their registration to undergo an inspection and carry fitness certificates.

In view of the mounting toll of road accidents and the number of old vehicles in use, it is necessary that all motor vehicles using the road should undergo compulsory inspection. In the case of motor cars and motor cycles in view of their large number, they may be issued fitness certificates valid for periods ranging from one to three years, depending on how well they are looked after.

6.4.6. **Inspection Code**

A motor vehicle inspection code should be framed setting minimum standards for the safe performance of motor vehicles. There should also be an inspection manual designed to aid the authorities in putting the code into effect and to encourage a standard procedure for the setting up and operation of inspection stations.

A standard of braking performance should be laid down for the guidance of testing officers, vehicle repair workshops, vehicle owners and manufacturers. We understand that some foreign countries have fixed a standard for braking performance and in certain cases different ones for the hand and the foot brakes. We suggest that in the early stages the standards should not be unduly severe, but higher standards should be gradually adopted as the owners get used to the test and appreciate its usefulness.

6.4.7. Spot Inspection

A Motor Vehicle Inspector or a Police Officer of a rank not below that of Inspector should be vested with authority to stop vehicles considered unsafe, inspect them and issue suitable orders if they are found unsafe. He should give a written order to the owner/driver, with a copy to the Department registering the vehicle to obtain a Certificate of road worthiness, within a week. In order that a driver is not harassed, the inspecting officer should give him a certificate of inspection detailing the parts inspected.

The existing rules give power to the authorities to carry out such spot inspection. However, such surprise checks now are often carried out at random, since it is said, the enforcement agencies are inadequately staffed to undertake the responsibility on a systematic basis.

6.4.8. Additional Staff

The compulsory inspection of all motor vehicles at intervals will call for a large number of mechanically qualified staff, but considering its advantages, it will be worthwhile to incur the expenses involved. Government may charge a fee for the inspection, the revenue from which can be utilised to meet the cost.

6.4.9. Inspection Procedure

The inspection procedure to be followed may be on the following lines :

(i) Owner receives a notice to present his vehicle for inspection.

(ii) On arrival of the vehicle at the specified place a card is given to the driver bearing the registration mark of the vehicle.

(iii) The vehicle undergoes the prescribed test and the Inspector notes the result on the card.

(iv) At the discharge point the driver hands over the card to the Officer-in-Charge. The latter issues him a certificate of fitness if the vehicle has undergone the tests successfully. If, however, the vehicle has failed in the tests, the driver is informed accordingly in writing with reasons for the failure and a 'Stop' notice is pasted on the windscreen. At the same time he is asked to present the vehicle for re-inspection within a specified period. He cannot remove the 'Stop' notice or use the vehicle except for specified journeys.

A question may be asked as to how many years after registration, motor vehicle should be subjected to the compulsory inspection procedure. Where the law already lays down that the operation of certain classes of motor vehicles is subjected to their holding a current and valid mechanical certificate of fitness to use the roads, the problem does not arise. In the case of other motor vehicles, they should be subject to compulsory periodic inspection and adherence to prescribed fitness standards when they are three years old and above.

6.4.10. Vehicle Inspection or Testing Stations

In order to carry out a programme of inspection of motor vehicles to weed out un-roadworthy vehicles, it is necessary to set up Vehicle Testing Stations as in the United States of America, the United Kingdom and some other countries, where the value of regular testing of motor vehicles has been widely recognised. There are two methods in vogue for this type of activity. According to one, the inspection of vehicles is carried out by Stations managed by Government and equipped for testing vehicles with reference to the following :

1. Brakes
2. Steering
3. Alignment of wheels
4. Tyres

5. Lights (headlights, stop lights, dippers, side lights, indicators, etc.).

This is sometimes supplemented by mobile units which check the vehicles by surprise tests, while they are on the road.

According to the other method, certain well-equipped private garages are licensed to discharge these responsibilities and issue the necessary certificates of inspection. These certificates are required to be obtained by all vehicles using the highways on payment of a small fee either at the Vehicle Inspection Stations where they present themselves on their own for examination or, at any other Stations where they are called up for inspection.

The principal handicap in this operation noted today, has been recruitment of the right type of personnel trained for this type of job at a level of remuneration which will not prejudice the thoroughness with which the inspection is to be carried out. The situation, however, does not permit of indefinite waiting for redress of all the shortcomings and some measures have to be instituted on these lines in this country also. There should be arrangements for the expeditious despatch of the fitness certificates to the Central Registering Office so that the defaulters are immediatel called up and asked to comply with the requirements.

Since these stations will have to work on a self-supporting basis, a minimum turn-over of 20,000 vehicles annually would be necessary for each Station. The location of these stations should be such that they may be able to attend to all the motor vehicles within a reasonable distance from them. For other areas which are not served by these Stations, Mobile Testing Stations, should be introduced so that the inspection programme is effective for all the vehicles plying in the country.

The present practice of Motor Vehicle Inspectors doing this work by surprise checks in addition to their other duties, is inadequate to meet the requirement.

Vehicles should be called up for inspection according to the registration number and the result of the inspection recorded on duplicate cards, one card being retained by the owner and the other by the Station. When a vehicle has been inspected and approved, it should be given a small sticker varying in shape and colour according to the date of the inspection. If a vehicle is rejected, the owner is to be given time in which to have the necessary repairs and adjustments effected before re-submission of the vehicle for further inspection.

If the law as it stands at present does not give adequate powers to enable satisfactory tests to be carried out by the Transport and Police Authorities on the lines indicated, it is recommended that it should be modified.

6.4.11. Safety Officers

Large transport organisations operating a minimum of twelve motor vehicles should employ a Safety Officer whose responsibility will be to see to the proper maintenance of the vehicles in his charge and to their compliance with all the legal requirements. He will also act for his organisation as a liaison officer with the authorities.

6.5. Registration of motor vehicles

Under the Motor Vehicles Act and the rules framed thereunder, no person shall drive a motor vehicle and no owner of a motor vehicle shall cause or permit the vehicle to be driven in any public place or in any other place for the purpose of carrying passengers or goods, unless it is registered with the authorities and bears approved registration marks. Notwithstanding this requirement, there are quite a few motor vehicles plying on the roads without valid registrations or with registration marks that are not genuine.

Similarly, there are a good number of motor vehicles using the road in each State displaying registration marks of other States. Such vehicles are supposed to obtain and display local registration marks, if they remain in another State for more than twelve months. This rule, however, is not strictly observed and so we find many vehicles plying in other States with their old registration marks, even after expiry of the permissible period. The identification and penalisation of these vehicles committing infractions of the traffic rules is difficult, because the local authorities often are not able to furnish particulars of ownership of such vehicles. Nor are the registering authorities of the States of origin prompt in furnishing the required information when it is asked for. As a result, the traffic offenders concerned are likely to escape the long arm of the law and go scotfree.

In order to obviate and reduce the infractions committed by such offenders, regular programmes for checking the registration of vehicles using the roads are essential. Such surprise checks have a prompt and healthy effect in preventing evasion of the law and those guilty of lapses have need to be punished and not allowed to operate their vehicles until they comply with the requirements of the law.

The creation of linguistic States and the rise of 'linguistic patriotism' have led to display of vehicle number plates in the local languages with even the numerals in characters other than Arabic understood all over the world. This is in violation of the Motor Vehicles Act and adds one more handicap to the enforcement authorities, if they are not familiar with the language of the number plates. Unless there is uniformity in the display of registration marks, there is a possibility of the vehicles escaping identification when involved in the commission of offences in States where the authorities cannot decipher their registration marks. As a result of non-conformity with the standard size of letters and numerals, there is a possibility of smaller letters and numerals being used which will affect discernibility from a distance. At the time when registration marks are assigned, it should, therefore, be made obligatory for the owner of all vehicles to obtain registration number plates conforming to the prescribed regulations, which should be supplied either by the authorities themselves or by an agency approved by them. When a vehicle changes hands, the change of ownership should be promptly entered in the records of the registering authorities. If there is a time lag in effecting changes in the particulars of registration, it is an obstacle to effective enforcement. Under the present regulations, when a vehicles is sold, it is incumbent on the purchaser to get the change of ownership effected and entered in the Registration Certificate within thirty days of the transaction. Instances, however, are not lacking of this rule being abused, particularly where transactions take place through second hand car dealers.

The existing difficulties can be overcome if the responsibility for effecting the change of ownership is laid on both the purchaser and the seller of a vehicle within a stipulated period. This will not only ensure the entries of ownership being brought up-to-date in the registration records, but will also facilitate the prompt identification of its owner and the institution of proceedings against him for traffic violations.

6.6 MOTOR VEHICLE EQUIPMENT AND SAFETY

6.6.1. Vehicle lighting

Almost all the manufacturers of motor vehicles claim their equipments to be of internationally accepted standard and that the complaints against them arise more from their misuse rather than from any inherent defects in them.

6.6.1.1. Head lights

Combining the arrangement for distant and near visibility (by dippers) they ensure driving of vehicles at night with safety at reasonable speeds even on the non-illuminated roads. With the sealed beam type of units, there is very little possibility of the equipment being hazardous to on-coming vehicles. It has, however, been noticed that due to a varying height in the placing of this equipment, the glare from it sometimes blinds an on-coming vehicle even when both the vehicles are using the dippers of their headlights. Therefore, there seems to be a need for standardising the height of such headlights from the ground level. Several truck drivers are said to make use of an improvisation whereby they can keep both the filaments of their headlights glowing together. They do this to gain advantage over an on-coming vehicle which is sometimes forced to leave the carriage way even at the risk of slipping down a side slope or hitting a side obstruction. There is a necessity, therefore, to immunise the equipment so as to put a stop to this malpractice for good.

6 6.1.2. Auxiliary Lighting

The other lighting components consisting of the parking lamps, the stop lamps at the rear, the number plate illuminators, and the direction indicators, should be made compulsory on all vehicles including trailer units. As fitted at the time of manufacture of vehicles, they are in conformity with accepted requirements but, there appears to be no prescribed standards for their levels of illumination and also for the opaqueness of the reflectors. As such, in many cases they have a disturbing effect on drivers of vehicles in the rear. The Indian Standards Institution should take up this case for standardisation and the authorities should see that all the rear lights and the reflectors used by the manufacturers conform to the prescribed standards.

Several non-standard equipments for lighting are also used as extras on some vehicles. These include flash lights (which are very useful when automobiles are used for shooting expeditions) or flashing beacons which are suitable for emergency vehicles. While their use can be justified under special cricumstances, it should be prohibited by law under normal traffic conditions. There should be a total ban on lighting accessories such as triangular illuminated red lamp on the rear wind screen and miniature signal heads.

6.6.1 3. **Amber lamps**

These are auxiliary lighting equipments which have the special advantage of being visible from a long distance under foggy conditions. By their use the oncoming and following vehicles can spot one another over safe distances under low visibility conditions and thus avert the hazards of head-on and rear-end collisions. Since the occurrence of foggy conditions over protracted periods is not common to all parts of the country and driving under such conditions is more dangerous, mainly along tortuous alignments of the hill roads, where these conditions are also more frequently present, the use of amber lamps can be made selectively mandatory on vehicles using such roads regularly. In the case of oversized vehicles using the roads under foggy conditions, it may also be desirable to use small amber lamps at their extreme ends to indicate a safe margin for passing them. A fixed standard for the levels of illumination, the colour and size of the above fittings should be developed, so that they are effective in their operation.

6.6.2. **Speed Governors**

Many of the ardent advocates against high speed insist on equipping motor vehicles, particularly the commercial types, with speed governors. Basically, this equipment functions by throttling the fuel supply to the engine as the shaft speed goes above a certain limit, thus ensuring that vehicles moving in a level terrain do not exceed a prescribed speed. This arrangement would, however, prove to be a handicap for a vehicle which has to climb up a gradient, when a bigger engine effort is required. Nor would it act as a check on high speed on a down gradient, particularly when some drivers resort to the practice of free wheeling in the running of their vehicles on such occasions.

Though this equipment was quite frequently adopted in the early days of development of the motor vehicle when the latter was looked upon as a road hazard, the present day thinking when greater speed is the aim of all motorists, has made it obsolete. Therefore, we do not recommend consideration of its use. Instead of it, we are for better road conditions and better enforcement of road safety measures.

6.6.3. **Tachographs**

This equipment is indigenously manufactured and records on a circular disc the periods of movement and stoppage of a vehicle in a continuing way together with the varied speeds attained by it. It forms a permanent record of the conduct of a driver in using the vehicle and is a useful instrument for scheduling of transport service. It encourages driving at a sustained speed leading to fuel economy in the use of a vehicle, and acts as a deterrent to idling en route and thereafter making up for it by going all out.

The utility of this equipment is contigent on a proper study after each trip of the record imprinted by it, so that the necessary corrective measures may be taken against a particular driver. Hence it can be used with advantage by organisations which have arrangements for the above. As an enforcement tool for use on all vehicles, it has limited usefulness. Many suggestions were received during our discussions, both for and against the use of this equipment. Therefore, though we fully endorse its selective use, we are not in favour of its use being made mandatory.

6.6.4. **Seat Belts, collapsible steering column and dash board fittings**

In any accident in which a motor vehicle is involved, the occupants of the vehicle are injured because there is a relative movement between the vehicle and the occupants thereof. When a moving vehicle suddenly comes to a stop due to an accident, its occupants, who have been sharing its momentum, are thrown with great force either out of the vehicle or forward, in the vehicle itself and strike against its hard-surfaces, resulting in injuries to them. The basic thing, therefore, is to prevent this involuntary movement and for this purpose, a seat belt would prove to be immensely useful.

Much work in this connection has been done by the Cornell Aeronautical Institute in the U.S.A. From their studies, they have concluded that the three most dangerous and traumatic instruments in a car are the steering assembly, the instrument panel and the windscreen. Next to the steering assembly, the instrument panel stands first in frequency and second in seriousness of injury. In this case also, the injuries are inflicted in the same fashion *viz.*, the car is suddenly decelerated, the person or persons sitting by the side of the driver are suddenly thrown forward and strike the hard edges or one of the knobs of the instrument panel or even its glove compartment door which generally opens out when an accident takes place. There was a case when the eye of a boy was knocked out by a knob on the instrument panel. In another case, a projection of about the eighth of an inch of a screw in a bracket holding a sun-visor, ripped the scalp of a woman from her hairline to the back of her head.

The steering assembly ranks first so far as seriousness of injury is concerned. As may be expected, the driver of a vehicle is the person most likely to be injured by it. When a car comes to a sudden stop due to an accident, the driver knocks with a great force on the steering column and is impaled upon it, resulting in a fracture of his chest bones or the neck. Due to the impact, the steering column is displaced backward and upward and in that event, nothing can prevent the driver from serious injuries and possible death, unless it is made collapsible.

The windshield ranks third for frequency as a cause of injury in automobile accidents. The Cornell study shows that 11.3 per cent of all people injured in automobile accidents were hurt by it. Almost 90 per cent of the injuries of this class are injuries to the head. Neck injuries are rare but usually more severe. Even less severe windshield injuries often cause permanent facial disfigurement.

Thus, to prevent injuries to the passengers of a vehicle, the following measures are essential, namely :—

(i) to provide seat belts;

(ii) to change the design of the dash board in such a way that no knobs protrude;

(iii) to provide a collapsible steering assembly;

(iv) to cushion the interior of the car with thick padding material in such a way that force of the impact between the passenger and the body of the vehicle is dissipated; and

(v) to use safety glass for the windshield.

Since a seat safety belt acts as a source of restraint on the freedom of the wearer, motorists have to be convinced of its usefulness. The advantages from the use of this safety equipment are established by experiments and experience. It is, therefore, desirable that local manufacturers are induced to use safety belts as a standard equipment. Relative to the overall cost of motor vehicles of all types, they would mean a very small increase in it which is not likely to affect their sales potential in the market. What is important is that the use of this equipment in motor vehicles in the country in a general way, will lead to a reduction both in the number and the seriousness of accidents. The recent step taken by the Ministry of Shipping and Transport (Transport Wing) to commend the use of safety belts by the State Transport Undertakings is a move in the right direction.

There are quite a few new safety equipments, like the anti-wheel locking device and the servo-mechanism for reducing the braking-effect, used in some vehicles. Their adoption as standard equipments of motor vehicles in this country, however, calls for further investigation.

6.7 **Safety of Motor Cyclists/Scooterists**

From a study of motor cycle/scooter accidents conducted in Delhi, almost all deaths and seventy per cent of the severe injuries were accounted to injuries on the head and the face. It is, therefore, suggested that suitable legislation should be made for making the wearing of safety helmets or some other suitable head-gear, by all drivers and pillion riders, compulsory. In the meantime its use should be encouraged by allowing a higher rate of insurance compensation for light injuries when the victim involved in an accident was wearing a safety helmet at the time of its occurrence.

As dust or insects are likely to cause sudden inconvenience to motor cycle riders and thus create circumstances in which an accident is likely to take place, all motor cyclists/scooterists should be encouraged to wear goggles.

In case of heavy motor cycles, a bar or a tube or any other device should be provided on either side and both towards the front and rear. Such a device should be of sufficient strength to support the weight of the vehicle so that the rider's legs are protected if the motor cycle falls on its side.

It is also suggested that the rear wheel of the motor cycle should be properly covered by a suitable device so that loose garments of the pillion rider may not get entangled in its spokes.

While making a turning movement, specially to the right, scooter riders are expected to watch the traffic at the rear and then to make the movement after giving a hand signal. Because scooters are not provided with rear-view mirrors, their riders are not able to see readily the traffic coming from behind. For the safety of scooterists, rear view mirrors should be compulsorily fitted to all these vehicles. It is also suggested that stop lamps and illuminated direction indicators should be standard equipments of these vehicles.

Strict enforcement measures should be taken against riding by more than two persons or against the transport of heavy weights on a scooter or a motor cycle.

Following other vehicles too closely, jumping the queue, improper turning movements and all such other antics which motor cyclists and scooterists indulge in, because of the easy manoeuvrability of these machines, should be strictly controlled by the enforcement authorities.

It has been found that scooters are more prone to over-turning because of the small size of their wheels. It is suggested that the size of the wheel of these vehicles should be increased.

Since motor cycle and scooter drivers are more exposed to accidents, educative measures to make them alive to the special danger to which they are exposed should be taken at the time of awarding a licence to any of them.

6.8 **Other highway vehicles**

As some vehicles other than motor vehicles, also ply on the highways and as some motor vehicles are used for some special purposes, the following suggestions are made for the improvement of their operation :

6.8.1. **School buses**

(i) School buses should have metal bodies with low entrance and exit steps. They should be fitted with grade handles and adequate guard rails;

(ii) They should be painted yellow with black stripes and the words "School bus" should be displayed prominently on the front and the rear of them;

(iii) The driver's cabin should be separate and communicative;

(iv) The seats should be facing the front of the vehicle; and

(v) There should be an emergency door in the panel of the body.

6.8.2. Tempos and three-wheeler rickshaws

As the construction of tempos and three-wheeler rickshaws is such that hand signals cannot be seen by the following traffic, these vehicles should be fitted with blinkers. Side-marker lights and rear-view mirrors should also be fitted to them compulsorily.

6.8.3. Slow moving vehicles

(i) Cat's eye reflectors should be provided on slow moving vehicles such as tongas, bullock carts and bicycles;

(ii) Bullock carts should carry a light during dark hours; and

(iii) Slow moving vehicles plying in an area with steep grades should be fitted with suitable brakes.

6.9. Pedestrian safety

In metropolitan cities, pedestrians are the worst sufferers in road accidents. The plight of the pedestrians is both due to their own negligence and the fact that they are not considered as a separate traffic unit by other road users. Lack of proper facilities for pedestrians also plays an important role so far as their safety is concerned. The following suggestions are made to ensure better safety for them :

(i) Wherever possible, side walks of proper and sufficient width to meet the estimated volume of pedestrian traffic should be provided on both sides of the carriage way. These side-walks should be free from all encroachments by pedlars, hawkers, beggars, and those in the shape of booths and stalls erected by various authorities and institutions;

(ii) Side-walks should be separated from the carriageway by placing railing barriers. Access to the carriageway from the side-walks should be at pre-determined places;

(iii) Zebra crossing should be provided at the places of access to the carriageway. The rights of precedence for motorists and pedestrians at these crossings have to be defined. At uncontrolled zebra crossings the vehicle should be required to give right of way to pedestrians when they are using them;

(iv) Zebra crossings should be provided in the vicinity of schools and other such institutions. Enforcement authorities should regulate the traffic at these points at peak hours *i.e.* opening and closing hours of these institutions;

(v) On either side of the zebra crossing, safety zones of about 20 metres length should be marked where parking, halting and overtaking should be prohibited. This would ensure better visibility of the pedestrians at the zebra crossing,

(vi) Better lighting should be provided at pedestrian crossings;

(vii) Wherever warranted, push-button signals should be provided for pedestrians at midblock pedestrian crossings;

(viii) At busy intersections, a separate signal phase should be provided for pedestrians to cross over at a time when they do not come into conflict with any other traffic.

(ix) At busy locations grade separation in the form of overbridges or sub-ways, as the case may be, should be provided for the use of pedestrians;

(x) Shopping centres where the volume of pedestrian traffic is very heavy, may be converted into pedestrian precincts for specified periods by prohibiting the entry of vehicular traffic during that period. Such a regulation, besides ensuring road safety, will improve the environmental conditions for other activities;

(xi) Extensive propaganda measures should be undertaken to warn and educate the pedestrians about the dangers of joy-walking and using the road carelessly; and

(xii) Pedestrians committing minor offences should be asked by policeman on duty to adhere to the law. In case of flagrant breaches, some fines should be imposed. Mobile Courts should punish erring pedestrians on the spot to induce fear in their minds.

6.10 Road design, construction and maintenance

It is common knowledge that low standards of design promote road accidents. Therefore, it is a pre-requisite to safety that in designing a road, adequate consideration is given to operational requirements *i.e.* the character, volume and speed of traffic, not only of the present but also of the near future. Where this is not found possible, it is necessary at least to devise measures to regulate the traffic to suit the conditions of the highway. This process involves a thorough knowledge of traffic engineering and employment of many other measures attuned to safety. The building in of safety into a road is more easily achieved in its construction stage, rather than by methods of its subsequent improvement. Even the most minor detail of a highway has a significant influence on accident possibilities. Hence, an orientation towards road safety is called for in the education of all levels of highway engineering personnel. This safety consciousness of the engineers should be apparent to the road users even in the temporary measures taken by them for movement of traffic. They involve better arrangements of warning for diversions, the lighting of barriers and durable and smooth surfaces even along the diversions.

Safety in the post-construction stages is aided by good road maintenance, which beigns the day a highway is open to traffic and continues till the cost of upkeep is so prohibitive that the work needs to be replaced. This involves keeping the shoulders firm, smooth and flush with the pavement edges, the repairing of pot holes, cracks and corrugations of the road surfaces; the repainting of traffic lines; the removal of fallen trees; the cleaning of ditches and culverts; the trimming of bushes and trees, to ensure adequate sight distances; the replacement of deteriorated and obsolete mandatory warning and direction signs; the painting of guard rails and road obstacles and, finally, keeping the public informed of road conditions especially during stormy weather and floods.

The constant inspection and upkeep of bridges, the clearance of land-slides and repairs to damage caused by floods have to be kept prominently in mind. In addition to making repairs at points of potential danger, alertness to detect deficiencies of design that may create traffic hazards is called for. There must be close co-operation between maintenance, traffic and design engineers to ensure the best results in the matter of road safety.

In areas where floods and other weather conditions are apt to demand emergency maintenance, a co-ordinated plan, adequately financed, must be prepared in advance. Such a plan should include a systematic analysis of weather forecasts and trends, training of personnel and arrangement for their prompt notification in times of emergency, apart from conditioning and disposition of the maintenance equipment according to probable need and provision of periodic relief of workmen during such emergency operations.

Traffic interference and some traffic hazards can be eliminated if maintenance operations in and near urban areas are scheduled during the off-peak hours and the slack seasons.

Speeds of traffic in cities are normally lower; but quick stops and changes in direction are frequently involved. Surfaces that become slippery when wet are often left without attention. There is also need for light coloured surfacings such as concrete or tinted surface dressings to improve visibility by night.

Maintenance operations are also simplified by selection of structural designs of pavement adequate for the traffic loads, so that immediately following adverse weather conditions which affect the stability of the pavement, serious damage hazardous to traffic, is not caused. In addition to these general requirements, there are other features of highways and their planning affecting road safety which are enlarged in the following sections.

6.10.1. Street lighting

The main hazards in night driving on unlit roads and streets is the blinding effect of the head lamps of an approaching vehicle, which have necessarily to be used for visibility of the road, to drive at a reasonable speed. The required amount of discipline involved in the use of 'dippers' to avoid this effect, is often wanting and even if they are used, no claim can be made to their total effectiveness. Hence, wherever there is a large volume of traffic on the roads and streets and also where obstructions are caused by slow moving and pedestrian traffic, conditions hazardous to driving at night are created. The remedy to avert or reduce the accidents in such cases lies in the adoption of proper standards of street lighting. Though no studies have been carried out in this country to relate factors of traffic and lighting standard to severity and frequency of accidents, studies on these lines carried out elsewhere indicate that street lighting contributes significantly to a lowering of the accident rate. From the results of traffic safety improvement programme carried out in California in recent times, it has been established that with the introduction of safe standards of street lighting, there was a reduction in the total number of accidents to the extent of 12.4 per cent, while the decrease ranged from 40 to 60 per cent in the number of persons killed. In terms of direct savings resulting from this reduction, they were as high as 2.85 times the expenditure incurred on improvements to street lighting. Comparatively, they came next only to the savings resulting from improvements to pavement surface condition or provision of traffic signs and illuminated pavement edges which ranged from five to six times the expenditure incurred on them.

The Indian Standards Institution has developed a standard for street lighting detailing the principles and standards in terms of various related factors; but in built-up areas where street lighting is a must, it is nowhere near this standard. The main factors governing the requirements of street lighting are the volume of traffic, the colour and condition of the pavement surface, and to some extent the road-side developments. The higher the volume of traffic and the darker the colour of the road surface, the greater should be the standard of illumination.

The standards for street lighting laid down by the Indian Standard Institution are also related to the classification of the street system in cities. One of the major handicaps in the way of achievement of the required standards of street lighting in the urban areas, is the paucity of funds. In addition, the uneven distribution of the available resources, with more funds spent on the main roads, results in a poorer standard of lighting on secondary and minor streets. Therefore, most drivers find it difficult to adjust their reflexes as they move from one street to another, quite often resulting in accidents. Hence, two things are called for by way of answer to this problem. First, augmentation of the resources and, secondly, adoption of a system of adequate and graduated standards of lighting on connecting roads. This would only be possible if both long term and short term plans are worked out for different areas and pursued for implementation in a systematic manner.

6.10.2. Wayside Amenities For drivers

One of the potent causes contributory to accidents involving heavy commercial vehicles on the highways is fatigue of their drivers. Creation, therefore, of suitable rest houses, with adequate parking space and with proper facilities for their board and lodging and for the servicing of their vehicles, is one of the main solutions.

A point made at many of our discussions was that inadequate communication facilities for use by officials as well as by the motoring public, resulted in delays in the reporting of road accidents or of possible traffic hazards. Therefore, without timely action to clear the hazards or to give a warning about them, the chances of accidents are increased. In the case of fatal and major accidents, the victims suffer for want of assistance, as there is undue delay in calling up help. We feel that if telephone facilities are made available, at least along the busy highways at intervals of about fifteen to twenty kilometres and their location properly marked for easy identification from the road, many untoward happenings will be prevented and many lives saved.

The problem of wayside amenities has been investigated recently by a special Committee constituted by the Ministry of Shipping & Transport under the chairmanship of the Director General (Road Development), and detailed recommendations in this regard should be soon forthcoming.

6.10.3. Ribbon Development

Amongst the many factors contributory to accidents on our highways, one of the most serious is that of ribbon development (Photo 10). Based on a tradition of premotor vehicles era, when roads were intended to serve the purpose of access to roadside development, the practice has persisted to such an extent that it has marred the very utility of a road from the point of view of motor traffic. In the absence of strict enforcement of land use, both commercial and industrial developments and even sometimes housing have spread over the land abutting the highways along the periphery of urban areas, causing considerable distraction and hazards to the drivers of motor vehicles. Their impact on accidents is greater where short lengths of such development are involved. It is so because the drivers of vehicles moving at high speeds find themselves unable, for lack of adequate opportunity for advance conditioning in such cases, to modulate their

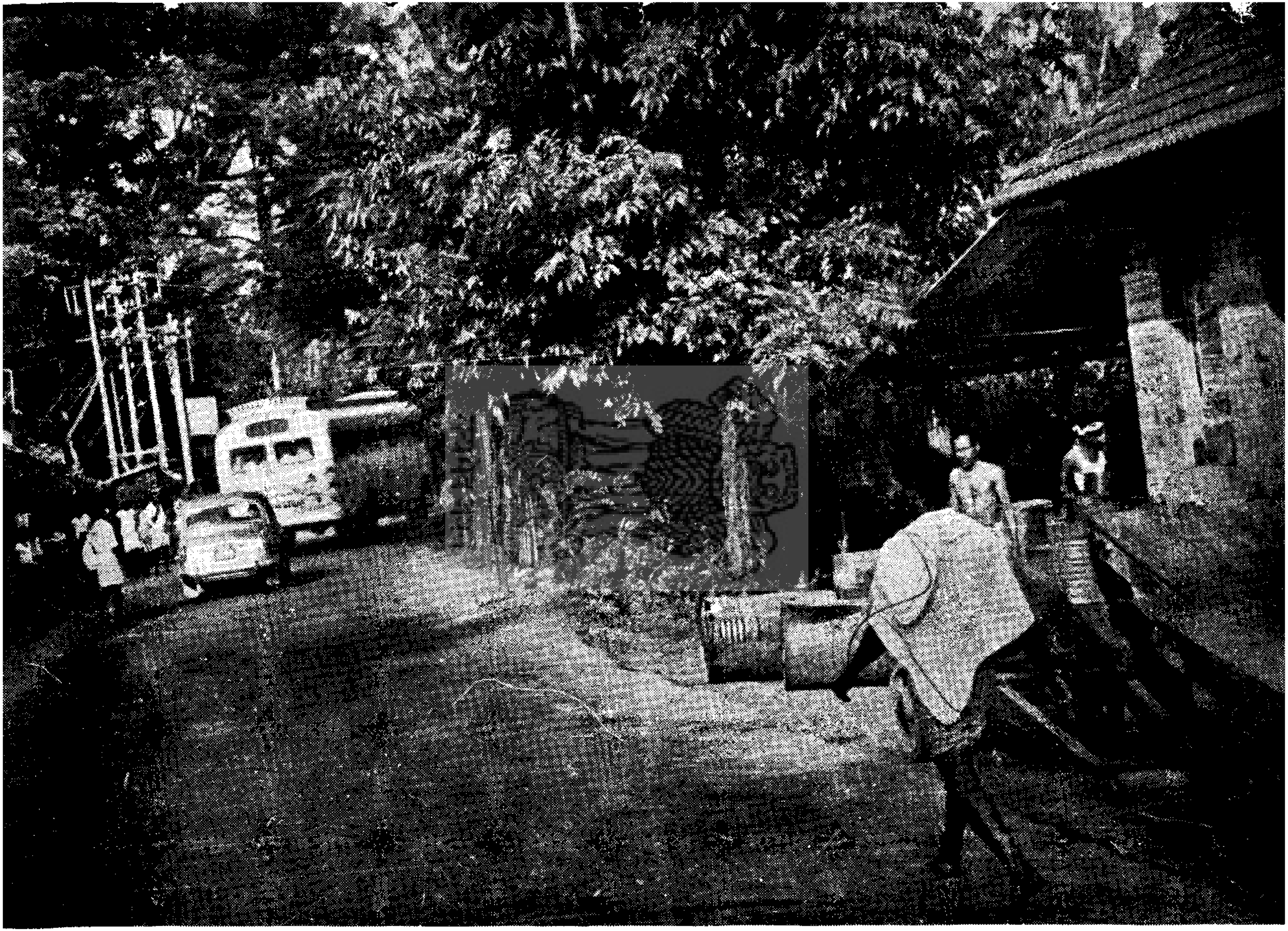

PHOTO 10—Ribbon development on National Highway

speeds suitably. Besides, the level of education of the public, who frequent such development areas, is so poor that they are totally unmindful of their own safety while using such roads. To complicate matters, very often the main road in such cases is encroached upon for purposes of retail shopping, drying of grain and various other activities.

Though some laws have been passed in a few States for the prevention of ribbon development, as also for the regulation of roadside land use, no concerted action has been taken so far, for their enforcement to achieve the desired results. Since this subject is the concern of the Central Government in relation to the National Highways and of the State Governments and of local administrations in respect of the highways in their territories, a model legislation by the Centre providing for extension of such legislation to States and the creation of an authority for enforcing the requisite measures is an urgent necessity.

6.10.4 **By-passes and Ring Roads**

6.10.4.1. **By-passes**

Many of our main highways have built-up areas on either side of them, at times almost touching the edge of the paved surface of the road. These developments are predominantly commercial in nature and at times also residential. An abrupt entry from the open country into these areas fails to provide the opportunity for conditioning the drivers of the motor vehicles for a reduction in speed, necessary for safe driving through such stretches of the road. Consequently numerous accidents take place, by the vehicles hitting pedestrians either crossing the highway or abruptly entering it from its neighbourhood. Sometimes the parking of vehicles along such lengths of the highway also causes obstruction with dire consequences. At the points of such highways where there are schools or play grounds, children frequently face the risk of being run over by vehicles. It is, therefore, necessary that where such conditions exist and where adequate traffic control measures are not practicable, by-passes diverting the main highway traffic outside the built-up areas should be provided. It is also necessary that once the by-passes are built, strict measures are taken to regulate all the road-side developments along them so that the purpose of the bye-passes is not defeated. Besides there should be sign posting for these by-passes.

6.10.4.2. Ring Roads

Many of our highways pass through the core of big cities thereby necessitating their use both for local traffic and for traffic from outside. The congestion thus caused contributes greatly to the potential of road accidents along such stretches. One of the solutions that suggests itself is the development of ring roads, that is to say, roads skirting the periphery of a town. In case of large cities, there may be a need for more than one system of ring roads, in the form of an inner and an outer ring road. These roads should be developed to a very liberal standard of geometrics and they should also be immunised from their road-side activities, so that through traffic as well as the one to the peripheral areas may prefer their use, either because of the ease of driving on them or of the time saving involved.

In the development of by-passes and ring roads, a proper traffic survey should be conducted in regard to the nature of traffic and their origins and destinations so that their alignment, their geometrics and traffic control measures may provide for present as well as future requirements of traffic.

6.10.5. Truck Terminals

A large number of service vehicles of different types, like pick-ups, delivery vans, and trucks meant for carriage of refuge and building materials, ply in large cities, thus causing congestion on the road. Where the streets are narrow or few in number, this problem is met to a certain extent by an adjustment in the timings of their movements so that they do not clash with the hours of normal vehicular traffic. They can also be subjected to restrictions regarding their parking, loading and unloading.

The requirements of Metropolitan cities also encourage the development of a large volume of traffic of buses and trucks to and from outside areas. In the absence of any suitable arrangements for parking of the vehicles and for storage of goods brought in or carried away by them, a very large part of their movements have to take place on the city roads, adding to traffic congestion, not to speak of the hazards to which they give rise. With a proper planning for the reception of such vehicles and storage of the goods carried by them in the periphery of the Metropolitan cities, much of the problem created by them can be solved. This postulates the necessity for construction of suitable truck terminals in the out-skirts of these cities which will automatically eliminate the movement of these vehicles along the net-work of roads inside the cities. Since many of these trucks arriving from outside are also engaged in the distribution of their freights at various points in the city, the storage of such freights at a truck terminal and their subsequent re-grouping area-wise would eliminate the trips that would otherwise be necessary for the distribution. The assumption is that this would be done with the help of smaller vehicles to better advantage.

It was represented to us that truck termini did not exist in most of the cities and steps should be taken to establish them. The success of this measure would largely depend upon proper location of the truck terminal in relation to the principal highways entering the city, its easy access and the availability of its storage and handling facilities from the point of view of their economics. Several cases were cited before us in which the poor location and marginal amenities available, detracted from the usefulness of the terminals set up. Therefore, due care must be taken and consideration given to the relevant factors before they are sited.

6.11. **Traffic control devices**

Traffic control devices which include signs, markings, signals and other devices such as channelising islands, guide posts, delineators and reflector markers, are basically safety devices, and their function is to guide the road users, warn them of potential hazards, delineate the right of way and channelise the traffic. Though they play a very important role in road safety, much importance is not at present given in the country to the installation and proper maintenance of these devices. Many of those installed do not even function effectively due to many short-comings. For effective functioning, these devices must fulfil the following basic requirements—

(i) compel attention of road users;

(ii) convey simple and clear messages;

(iii) permit time for easy response; and

(iv) command respect.

All these requirements are inter-related and they are met by giving due consideration to their design, placement, maintenance and uniformity in respect thereof. The authorities concerned have need to give considerable importance to these factors.

The following programme of action is suggested to improve the use of traffic control devices —

(i) Existing signs and markings on all streets and highways should be upgraded to conform to the standards worked out by the Indian Roads Congress;

On the basis of the experience gained in the country and elsewhere, standards for other traffic control devices should also be worked out, and the existing devices should be upgraded to conform to these standards;

(iii) Field inspection has to be carried out on all the major roads and streets to identify the needs of these devices in respect of location and type and they should be installed, if necessary, in a phased manner ;

(iv) There should be a regular programme of repair and proper maintenance of these devices;

(v) The cost of installation and maintenance of these devices should form part of the construction and maintenance budget of any road so that they are not affected by lack of financial provisions; and

(vi) The programme of maintenance, upgrading and installation of traffic control devices should be periodically evaluated by the proposed State Road Safety Councils and the National Road Safety Council.

6.12. Propaganda and Education

The problem of road safety concerns every individual for, everyone who uses the road is concerned with the safety of one's own life and property. And yet, it is a strange irony that the basic rules governing the correct and safe use of the roads are not known to a large majority of our population. Considering the serious complications to which this problem is likely to give rise in the future, judging from the present trend of increase in the number of motor vehicles; only a well-planned and vigorous programme of education in road safety can save lives from being lost in greater numbers on our roads. Such a programme should cover all road users—drivers and pedestrians, the children and the adults, the educated and the uneducated, the villager as well as the city dweller—and inculcate in them an awareness of their own responsibilities while using the road and of the danger that lurks at every street corner. For, safety on our roads is entirely dependent on the road sense displayed by every section of the road users.

6.12.1. Education of children

The motto, "Catch them young" has perhaps greater application in this case than in other fields of education. It is so because, in the first place, children with their impressionable minds are likely to retain the basic tenets of road safety more permanently than adults, and secondly, because, when they grow up, they will have to use roads far more congested than at present. So, if we are to profit by the experience of other advanced countries in this matter, we have to make sure that out children are equipped with basic knowledge necessary in this connection in order that they can measure up to the requirements of future traffic conditions.

While there is a general recognition, both in official and non-official circles, of the urgent need for road safety education in schools, no serious attempt has been made, even in metropolitan areas where the road safety problem is acute, to include it in the school curriculum. In fact, no organised attempt has been made to determine what exactly has to be taught to the children and how. The Road Safety Patrol Scheme in operation in some of the bigger cities, can at best be called an extra-curricular activity limited to a small number of children in some of the schools.

The object of road safety education of children should be to make the rules of the road a part of their basic knowledge of life and to help them cultivate a habit of observing them. Instruction in this branch should start right from the primary classes. In the initial stage, simple rules relating to the correct use of the road, and the possible consequences of not observing them may be pictorially represented, so as to make a deep impression on them. This may be followed up by more difficult rules, aided by educational aids, like posters, cinema slides, cinema shorts, slogans, models, comics and stories, with road safety as their underlying theme. In the secondary stage, a more practical bias can be given by a scheme of Road Safety Patrols (Annexure 12) to make them disciplined road users. By giving them an opportunity to assist the Police in controlling traffic at times like festivals, fairs, and similar other occasions, children are encouraged to assume responsibility and take pride in their work.

A traffic training park is one of the best methods of traffic education of children. It has miniature roads, road intersections of different types, road signs, road markings, traffic signals, parking areas and other facilities. While playing a game of traffic in these parks as a pedestrian, a cyclist or a motorist, children learn traffic rules and regulations. The Study Group visited such parks in different cities and had the opportunity to witness the children playing traffic game in these parks. In view of the role played by these parks in traffic education, it is suggested that such parks should be provided in all the cities and children of all the schools should be given an opportunity to play in these parks.

National propaganda through the Press and the All India Radio aimed at parents, to prevent their young children from using the road except in the company of a responsible person, should be coupled with an encouragement to them to train the latter in safe road habits from the time they are able to walk. This Press and Radio publicity should be augmented by local propaganda to parents by the local unofficial organisations devoted to road safety.

It, therefore, seems necessary that a national policy in regard to road safety education in schools, should be enunciated and the Government of India should appoint a National Committee on Road Safety Education, comprising Traffic Experts, Educationists and representatives of the general public charged with the task of :

(a) defining the basic Road Safety Code which is to be taught to children in schools; and

(b) preparing the blue print for a scheme of Road Safety Education in primary and secondary schools for adoption all over India.

The scheme should be immediately implemented and become part of the educational curriculum under Social Studies.

6.12.2. **Propaganda in Road Safety**

Propaganda in Road Safety is actually an extension of the process of education to adults, who have not had the advantage of road safety education in their childhood or whose awareness of the dangers of the road may have been blurred by the humdrum routine of their daily lives. As it has been rightly said "Accidents begin where caution ends", an average road-user has to be constantly reminded of the risks involved in being careless on the road or in non-observance of the road rules. The adult road-users have no patience or time for class-room instruction and so the approach to them has to be indirect and more subtle. The message has to be given to them in the garb of entertainment or through media like posters, slogans, cinema slides and television, which convey the requisite instructions at a glance. A very effective supplement is the large scale employment of mobile police vans equipped with amplifiers and loud speakers directing the public to observe the rules of the road. To have the desired improvement in the standard of behaviour of road users, safety propaganda has to be continuous and cover the widest possible section of the population.

6.12.2.1. **Cinema slides and Films**

Cinema slides containing pictorially illustrated safety slogans can imprint a message into the minds of the audience. Carefully-produced cinema films should present the theme of road safety from different angles, like drinking and driving, defensive driving, using the pavements and so on, to educate the masses. Such films must be produced in the form of a documentary and shown all over the country.

6.12.2.2. **Radio**

Apart from talks, skits and plays, with road safety as their basic theme, should be broadcast through the radio. Road Safety slogans can be used in the "commercials" of the Vivid Bharati.

6.12.2.3. **Television**

This is a new medium that is becoming increasingly popular in the country and should be utilised for inculcating road sense into the minds of the viewers.

6.12.2.4. **Posters**

Attractively and imaginatively produced posters can convey the message of road safety very effectively.

6.12.2.5. **Competitions**

Interest in road safety can be aroused by holding essay competitions, safety slogan and poster contests, among students as well as the general public.

6.12.3. Motor sports

Motor sports like reliability trials and rallies, serve to exploit the spirit of rivalry inherent in human beings for promoting safer driving and careful maintenance of motor vehicles. The distinction conferred on the drivers who win these events encourage them to take pride in skilful and safe driving.

6.12.4. Seminar and symposia

Organisation of Road Safety Congresses, Seminars, Symposia Study Weeks, Safety Weeks, etc., fosters exchange of ideas and experience on the various problems of road safety and the solution thereof. At the same time, it focusses public attention on the importance of road safety in our lives

6.12.5. Awards

Awards to drivers of public service vehicles with outstanding safety records and conferment of the distinction of "Driver of the Year" on drivers with good record, stimulate their interest in safe driving.

6.12.6. Press

Road accidents have become so common in our country that hardly any adequate notice is taken of them either by the public or the country's Press. Newspapers are powerful media of mass education. If only those who control them would wield their powerful pen for mobilising public opinion in favour of measures for promoting the cause of road safety, it will strengthen the hands of those who are striving for this objective, by creating a favourable climate that would ensure the success of their efforts. Road Safety publicity campaign in the Press by way of slogans, pictures and feature articles help in disseminating the message of road safety among the readers.

6.12.7. Sustained propaganda

Efforts at propaganda for road safety in the country are at present sporadic and cover short periods only. They are mostly confined to the metropolitan areas. Propaganda to be effective must be based on a planned and continuous programme, to reach the widest section of the population.

Lack of safety on the roads being a social menace, there is considerable scope for active work in this field by voluntary organisations and accredited representatives of the people. They cannot however be expected to carry on sustained campaign for educating the masses owing to their financial limitations and the fact that promotion of road safety is only one of their many activities.

The importance of road safety and the need for widespread education and propaganda on the subject, *inter alia*, call for the creation of a National Road Safety Council at the Centre with its counterparts in the States. The composition, constitution and functions of the National Road Safety Council and its equivalents in the States are described in Paragraph 6.14.

6.13. Traffic Accident records

6.13.1. Accident form A-1

As discussed in para 5.4, the existing Road Accident Form A-1 (Annexure 10) is deficient in many respects. There is need to make this form comprehensive to include additional information, such as exact location, geometric features of the road, classification of the road, type of area, particulars of the drivers involved, nature of accidents, cause of accident, type of manoeuvre such as diverging, merging and turning, responsibility of the driver and details of pedestrians and cyclists involved. Moreover, the form should be of a self-coding type, so that it will be suitable for mechanical analysis. The proforma proposed and being finalised by the Indian Roads Congress for adoption in the country is given in Annexure 13. The introduction of this standard form throughout the country has several advantages, *viz.*, (i) it will help the person reporting the accident to be thorough by suggesting the items to be reported, which he might otherwise overlook (ii) it will encourage a desirable standard data and accuracy in description of the details and (iii) it will provide a suitable form for collating information.

Instead of the present practice of collecting the details of fatal and severe injury accidents in Form A-1 and the details of minor injury accidents, accidents involving slow moving vehicles and mere collision type of accidents in daily Traffic Accident Reports called 'Daily Diaries', the details of all types of accidents should be, straightaway, entered in the proposed Form A-1. The process of making the entries first in the Daily

Diaries and then transferring the data to Form A-1, results in many columns being left blank, apart from the delay involved in getting the accident data for processing.

6.13.2. Road Accident Form-4

The present Road Accident Form-4 (Annexure-11) giving a summary of road accident data has many limitations and needs to be revised. A new Accident Form-4 has been worked out on the basis of the proposed Form A-1 and is given in Annexure 14. This form will help in obtaining all the useful information on an all India basis.

6.13.3. Other Recommendations

In all cities, the details of all types of road accidents should be filled in by an accident squad instead of the present practice of their being collected by the staff of the local police stations who do not generally have any special knowledge in the field. They are more concerned with identification of the offender for the purpose of prosecution and not so much with a complete analysis of the accidents. Hence, the need for setting up accident investigation squads with trained men and adequate equipment for the proper and systematic collection of accident data. For this purpose, a city should be divided into zones, each zone being headed by an officer not lower in rank than a Deputy Superintendent of Police, who should have all the accidents occurring in his particular zone reported to him.

In major cities, scientific investigation of fatal accidents should be carried out occasionally on a sample basis, by a team of experts including a police officer, a doctor, a traffic engineer, an automobile engineer and a psychologist, to find out the causes and to make concrete suggestions for better road safety. In all the major cities, there should be a statistical cell attached to the Superintendent of Police (Traffic) for compilation and analysis of accident data.

Traffic Engineering Divisions should be set up in all metropolitan cities to investigate into various traffic problems, including those connected with road accidents and to suggest suitable remedial measures. A Traffic Research Supervisory Committee consisting of representatives of organisations such as the Municipal Corporation, the Traffic Police, the Transport Department, the Highways Departments, voluntary organisations and the public should be set up to assist the work of these Divisions.

6.14 Suggested measures towards strengthening the organisation for road safety

Towards combating effectively the problem of road accidents, the following measures are suggested:

1. Establishment of a National Road Safety Council at the Centre.
2. Setting up of Road Safety Councils at the State and District levels.
3. Setting up of Traffic Engineering Divisions in the Corporations of Metropolitan areas and in the State Public Works Departments.
4. Setting up of special Traffic Enforcement Divisions in the State Police for proper enforcement of traffic regulations along the highways.
5. Creation of a Road Safety Fund of non-lapsing nature to meet the expenditure on special road safety projects.

6.14.1 National Road Safety Council

An Organisation by this name has been under the consideration of the Ministry of Transport for nearly ten years. The draft constitution of this Council as prepared by the Ministry was reviewed by a special Committee in 1962. Along with the modifications suggested by them, the scheme and the draft constitution of the National Road Safety Council (Annexure 15) was placed before the Transport Advisory Council at its meeting held on the 30th April, 1963, and both of them were approved. Therefore, to hasten the creation of this Council without further loss of time, the Study Group endorses the draft scheme as it stands today. However, if the Ministry of Transport feels that without prejudice to the above, some modifications could be incorporated, the suggestions of this study Group towards the same are as follows :

1. The following four items are proposed to be added to the objectives, to bring them into line with the recommendations of the Study Group:

(i) to help in applying widely the techniques of traffic engineering for ensuring safe and efficient flow of traffic and to recommend measures designed to achieve that objective.

(ii) to help in setting up standards for the manufacture of automobiles, their spare parts and accessories and tyres and improvements in internal and external designs of the vehicles for promoting safe travel;

(iii) to suggest amendments to the structure of rates of premia of motor vehicle insurances for promotion of road safety ; and

(iv) to maintain a National Driver Register on the basis of the scope and objectives described elsewhere in this report.

The work of the Council as proposed earlier, is to be carried out by a full time Secretary. It is suggested that the Secretariat should be enlarged to include two full time Assistant Secretaries, adequately qualified, one for the enforcement side and the other for the Traffic engineering side.

In addition to the different sources already suggested for raising funds for the Council, they should be augmented by an additional contribution from the Central Road Fund and appropriation of part of the Insurance premia, as detailed in the section on Road Safety Fund.

It is also suggested that instead of the National Road Safety Council nominating the State Road Safety Council, the States should constitute the State Councils and their functioning should be financed by earmarking adequate funds from the State vehicles tax supported by the funds allotted by the National Road Safety Council. Also to qualify for funds from the National Road Safety Council, it should be made imperative that the State should constitute the State Road Safety Council.

6.14. 2 State Road Safety Council

Just like the National Road Safety Council at the Centre, each State should have a State Road Safety Council to act as the working arm of the National Council at State levels, and coordinate the activities of various departments related to road safety, its functions being as follows:

(i) to arrange to get the data on road accidents on State basis and to work out recommendations for improvements;

(ii) to help in applying, widely, the techniques of traffic engineering for ensuring the safe and efficient flow of traffic and to recommend meausres designed to achieve that objective within the State ;

(iii) to undertake special studies of accidents and their causes and of accident prone areas including rail-road crossings to promote and/or to conduct research on all aspects of road safety and to suggest and publicise measures to reduce accidents ;

(iv) to help in carrying out Road Safety Check-ups in the States and to make a survey of motor vehicles with reference to such factors as their age, classification, make and condition in conjunction with other institutions or organisations;

(v) to collect, publish, produce, distribute and disseminate educational and informative data to all levels of the public by means of all forms including mass media such as the Press, the Radio, the films, the television, Cinema slides, posters, Pamphlets, Seminars and Lectures;

(vi) to draw up programmes for better performance in driving standards of motor vehicle drivers;

(vii) to undertake all allied acts which would improve road safety or achieve any of the objectives mentioned above; and

(viii) to allocate funds to various organisations after studying the proposals for improvement of traffic conditions and to supervise the implementation thereof.

Besides the funds allocated to the State Road Safety Council by the National Road Safety Council, additional funds may be raised by allocating a certain percentage of the State vehicle tax to them.

6.14.3 District road Safety Council

In addition to the National and State Safety Councils each district in a State should have a District Road Safety Council to act as the working arm of the State Safety Council. It should co-ordinate the activities of various official and non-official bodies, concerned with road safety, in the District.

This council should be constituted by the State Government and should include representatives of Government departments as well as members of the public from the district concerned. It should meet regularly to discuss matters of road safety and help to highlight the road safety problem of local interest apart from seeing that sustained action towards road safety is maintained. In the case of districts with large metropolitan areas in their jurisdiction, this council should exclude such areas. District Road Safety Councils should raise their own funds to carry out their programme and the State Road Safety Council should also give financial assistance to the District Road Safety Council.

6.14.4 **Traffic Engineering Divisions in P.W. Departments and Corporations.**

In addition to the National and State Safety Councils, Traffic Engineering Divisions should also be set up in the State PWDs., and in the Municipal Committees/Corporations of various large sized cities. These Divisions, besides feeding the State Road Safety Councils with the necessary data, will be working under their guidance and supervision for improving the existing conditions and providing built-in safety on new roads and locations.

The functions of the Traffic Engineering Division are given below:

(i) to collect and compile statistical data relating to the problems of the driver, the vehicles and the roadways and to prepare therefrom reports and recommendations for attention of the implementing authority. (It will also conduct studies on the nature and volume of traffic, its origin and destination, extent of losses due to congestion and accidents, factors affecting speed, safety and convenience in the use of roadway facilities and the effect of provision of various facilities. In other words, all types of studies relating to road transport operations);

(ii) To analyse data regarding the causes of traffic accidents and prepare recommendations for improvements both operational and engineering. To analyse accident records together with data such as, the volume of traffic and speeds, in order to suggest remedies for specific locations and provide a model for dealing with similar situations elsewhere;

(iii) to supervise directly the design, fabrication or purchase and installation of all traffic control devices ;

(iv) to conduct studies for speed zoning, establishment of "no passing zones" and proper pavement use ;

(v) to cooperate with enforcement officials in the planning and executing of necessary traffic regulatory measures;

(vi) to advice and assist municipalities/corporations lacking traffic engineering divisions of their own, on local traffic problems, traffic signals, traffic signs, road markings, design of parking facilities and traffic regulations ;

(vii) to participate in traffic research for the development of more effective traffic control devices and to obtain such other information as may lead to greater safety and efficiency in the use of present or proposed traffic facilities;

(viii) to cooperate with the Police, the Press, the Radio, Schools and Civic Groups, in the promotion of traffic safety; and

(ix) to co-ordinate between the various departments such as Telephones, Electricity, Drainage, etc. so that comprehensive plans may be developed to avoid repeated digging up of the roads.

6.14.5 State traffic police division

Except in a State or two, there is no suitable organisation to check the violation of traffic rules and regulations on rural highways for the State as a whole, although there is a great need for it because a large number of fatal and more serious accidents are taking place on rural highways. State Traffic Police Divisions should, therefore, be created to perform the following functions :

(i) to patrol the rural highways with a view to the checking of violations of traffic laws and regulations such as overloading and plying of unfit vehicles ;

(ii) to study the problem of road accidents on rural highways from the point of view of enforcement;

(iii) to investigate, in collaboration with the Traffic Engineering Divisions of the State P.W.Ds., the accident prone spots on rural highways; and

(iv) to collect, compile and analyse accident data through a separate statistical section.

6.14.6 **Road safety fund**

Lack of resources has been one of the main arguments advanced by all agencies through out the country, for the failure to carry out adequate road safety measures. It is imperative that positive steps in a planned manner are taken to improve Road Safety to alter the existing dismal picture of traffic accidents and resulting deaths. Towards meeting the expenditure on such steps, the draft constitution of the National Road Safety Council has suggested a few sources. The Study Group feels that a more definite and sustained support should be provided by diverting an additional 20 per cent of the Central Road Fund, exclusively for the use of the National Road Safety Council. The resulting reduction of accidents through a Road Safety Programme would be reflected in a reduction of compensation claims to be paid by vehicle insurance. Hence it is also suggested that 10 per cent of the insurance premia collection of motor vehicles should be diverted to the National Road Safety Council to augment its funds.

As visualised by the Study Group, the funds of the National Safety Council would not support all the road safety programmes in the country. They are to be used only for special expenditure in areas where sufficient interest in road safety is not forth-coming. The Council should also finance demonstration projects approved or sanctioned by it, besides all educational and evaluation programmes connected therewith. Road Safety is a vital concern for every one and hence sufficient interest and support should be generated at all local and State levels.

6.15 **Miscellaneous Measures**

6.15.1 **Traffic Aid posts**

The National and State Highways have an increasing volume of motor vehicle traffic, as they pass through various towns and are interlinked with many major and minor roads. Apart from fast mechanical traffic, these Highways also carry slow moving traffic in the form of animal drawn vehicles, pedestrians and cattle. The roads are narrow, with hardly sufficient room for opposing streams of traffic. So, when vehicles try to overtake or go fast, accidents are often caused. This is particularly so during the monsoon when the surface condition of the roads deteriorates and the shoulders become slushy causing skidding of vehicles.

In order to reduce the incidence of accidents on the National Highways and to bring about stricter enforcement of the traffic rules, the Government of Maharashtra established what are known as "Traffic Aid Posts" on an experimental basis in October 1959 at Thana, Panvel, Khopoli, Lonavala, Khandala, Vadgaon and Dhapodi on the Bombay-Poona National Highway No. 4. The introduction of these posts acted as a restraint on road users who were prone to violate the traffic rules. These posts enabled the Police not only to act speedily and more efficiently in cases of accidents of the 'hit and run' type, but also to rush to the scene of accident for rendering first aid treatment to the victims. As the scheme gave good and encouraging results, it was subsequently extended to the Bombay-Agra National Highway No. 2. Today, the scheme is operating on both the Highways from Bombay upto Poona and Nasik.

All these Traffic Aid Posts are connected with each other and with Bombay and Poona by two-way radio telephone link besides being provided with essential articles like First Aid Boxes and Motor Tool Kits for assisting road users.

The working and utility of these Traffic Aid Posts were explained to the members of the Study Group on Road Safety when they visited the Posts of Khandala and Ghoti. They were found to be housed in road-side temporary structures equipped with instruments for receiving and transmitting information. Two or three persons from the Traffic Branch are deployed at each post. One of them operates *i.e.* receives as well as transmits messages and also makes notes in a diary maintained for the purpose. On receiving information regarding a road accident involving serious injuries to persons, he flashes a message to all concerned to rush medical and other aids to the scene of accident.

Since the setting up of these posts, there has been better security on the highways and motorists can travel safely. In addition to the detection of cases of overspeeding, missing vehicles or vehicles involved in hit-and-run cases, a number of cases of smuggling of gold and other contraband goods, kidnapping and copper wire thefts, have been detected through the wireless network of Traffic Aid Posts. These posts are also found to be useful during journeys of V.I.Ps, being of some help in clearing the traffic on the highways. They are also in a position to guide tourists in case they approach them for assistance. In brief, since these Traffic Aid Posts are capable of being put to multifarious uses, they can be a boon to road users of all types especially motorists, if the scheme is extended to other important National Highways of this country. In view of the low cost of these Traffic Aid Posts relative to the numerous benefits accuring from them, this will be more than justified.

6.15.2. **Check posts for Checking Overloading**

Numerous witnesses highlighted the overloading of buses and trucks as one of the causes for road accidents. Drivers of such vehicles often lose control over them when running at high speeds, resulting in serious accidents. The number of existing check posts for the verification of loads of trucks are few and far between. In some States the only device adopted is the use of portable wheel weighers which do not go far enough. To discourage this practice of over-loading, therefore, which is indulged in purely from the profit making motive, to the total disregard of safety, what is indicated is that the offending vehicles should be promptly checked and relieved of their overloads at regular weigh bridges located at points of entry to and exit from main highways near big cities. What happens at present is that at the few check posts that exist, the facilities available not being adequate enough, to arrange for removal of the excess cargo, the vehicles are merely noted for challan and allowed to move on with it. Hence, measures should be taken to ensure, not only for weighment of the vehicles, but also for the excess load being removed and kept in proper custody. Only a sustained programme of this type can ensure the prevention of a malpractice of this kind.

6.15.3. **Speed limits**

Enforcement of the law in this matter is ineffective, because many of the speed limits are unnecessarily restrictive and therefore virtually unenforceable and also because of the Traffic Police being insufficient in number. Legal requirements which are not regularly enforced may do more harm than good, while selfish and inconsiderate driving, if unchecked, is only too likely to spread. The number of drivers who will continue to observe a speed limit which is widely and habitually exceeded with impunity by others, is bound to be a diminishing quantity. It is, therefore, desirable in the interests of road safety that traffic in urban areas should flow at even speeds in order to reduce the amount of overtaking. The inconsiderate driver who seizes every opportunity of cutting in or otherwise forcing his way through traffic, is also bound to lower the general standards of driving and to cause irritation all round which is not conducive to safety.

It is, of course, essential that the speed limit, if it is to be enforced, should be reasonable. Unreasonable requirements are unfair both to the Police and the drivers, and are liable to lead to bad relations between them. There are still many instances today of speed limits, for which there is little justification or which are set too low, and it is a matter of urgency that they should be rectified without delay. But legal requirements affecting road safety should, if they are reasonable, be enforced. Restrictive legislation, if it is not enforced, penalizes only the law-abiding. Heavy penalties, sporadically applied, are no substitute for an offence which he sees committed every day with impunity by others. He will, therefore, consider himself unfairly treated, and his respect for the law and for the Police will not be enhanced.

It is essential that decisions in regard to speed limits should be taken on the expert advice of traffic engineers. This must necessarily be based upon a scientific assessment of the various factors involved. The "prudent speeds" of vehicles should be observed and analysed in relation to the character of the particular road and the accident rate thereon.

In order that a speed limit may be effectively enforced it is essential that it should secure cooperation by the majority of drivers. It is also important when considering the accident rate, to examine whether road improvements can reduce the risk of accidents and whether in some instances there can be a more effective remedy.

It is not the fault of the Police that they do not do more to secure a higher standard of driving and of observance of the law. They are quite inadequately equipped for the purpose. In the result, two tried and proved methods of reducing accidents, *viz.*, the enforcement of appropriate speed limits in built-up areas and the use of properly trained mobile Police in sufficient numbers, are no longer effectively applied.

Existing speed limits should be reviewed as a matter of urgency and after such modifications have been made in them as are necessary and after lapse of a period of warning, they should be enforced. The effect of these restrictions on traffic flow and road safety should be kept under close and continuous review and the limits modified from time to time in the light of experience gained.

6.15.4 **Mobile Patrol**

Enforcement "tactics" for grappling with the problem of road accidents should include partolling which is the basic means for securing effective enforcement of traffic law, and one of the functions of the proposed State Traffic Police Divisions. Patrolling of the roads especially the highways by policemen acts as a deterrent on law infringers and thus helps to reduce traffic accidents. The presence of uniformed policemen has a psychological effect on inconsiderate road users; for, the fear of being caught violating the regulations has a restraining effect on them. Experiments carried out in other countries have shown that when a Police Officer was on duty an accident was unlikely to occur and that the greater the number of Police vehicles that could be placed on any given open road the greater would be the reduction in accidents. In Lancashire some years ago lengths of roads were black listed in each month for a short period and on each occasion the concentrated attention of Police partols produced a reduction in accidents averaging 73.6 per cent compared with the corresponding month during the previous year. Accidents were also reduced in other areas where similar experiments were tried.

The need for Mobile Police Patrols on highways has been stressed in the evidence tendered before the Study Group by almost all the States not only for preventing rash and negligent driving but also for putting down such evils as overloading of vehicles which contribute to accidents. With the growth in the volume of inter-State motor transport the overloading of goods and passenger transport vehicles is prevalent especially on roads not patrolled by the Police or where the enforcement agency is handicapped by insufficient force or an apathetic public opinion. This can be effectively tackled only if we have a system of patrolling of the highways by Mobile Policemen equipped with portable "wheel weighers." At the same time there should be a strengthening of the machinery for enforcement which should have at its disposal a sufficient number of powerful automobiles to chase and catch the culprits who ry to elude or escape the long arm of the law, in fast moving vehicles.

The Study Group, therefore, recommends that in some areas of sufficient size to yield reliable results highly trained mobile patrols should be employed in large numbers to ensure effective supervision of the areas. These patrols should be in uniform and should be provided with motor cycles rather than cars, because they can thus be more easily seen and can more readily thread their way through traffic. Their primary object should be to improve the standard of driving by advice, example and admonition.

The patrolling of the highways by Mobile Policemen should be supplemented by surprise Traffic Squads in fast moving automobiles to apprehend speed violations, hit and run cases, overloading of vehicles and other such infractions of the law.

6.15.5. **Traffic Wardens**

As the Police enforcement Personnel are never sufficient to check traffic irregularities and violations at all the points in cities, it will be helpful to augment it by inviting the co-operation of the public. This could be achieved by the institution of honorary Traffic Wardens.

These Traffic Wardens should be selected from the general public and the criteria for their selcetion should be their honesty and good character and also their proficiency in traffic rules and regulations. Their duties will be to report to the Police authorities, traffic violations by any driver or bus conductor or other road-user and the police authorities will take appropriate action against the offender. They should also render assistance to the victims of road accidents. If such a body is formed, there will be fear in the minds of all road-users that they are always under watch by somebody and as such accidents and other traffic violations will be reduced. This will also reduce the irregularities which are peculiar to the mass transportation system in metropolitan cities, *viz.* overloading in private buses and negligence towards passengers in Government or Semi-Government mass transportation undertakings.

It is suggested that Traffic Wardens should be appointed in urban areas having a population of more than four lakhs, and invested with some minor powers of the Traffic Police.

Details of the Scheme for Traffic Wardens operating in Calcutta are given in Annexure 16.

6.15.6 Ambulance

It was brought to our notice that in none of the big cities there are any facilities available for exclusive use by the police to rescue victims of road accidents and shift them to First Aid Posts and hospitals. This need is being currently met in serious cases by drawing upon the Ambulance services of hospitals and other community organisations. Ready availability with the Police of a few ambulance vehicles, properly staffed for First Aid, can ensure maximum salvage of the injured in accidents. Therefore, an assessment should first be made of the minimum number of such vehicles required for each of the big cities and they should be provided for use by the local Police.

6.15.7 Advertising Signs

Lack of control over the type, size, illumination or location of advertising signs along the road, in both urban and rural areas, is said to provide a cause for accidents in that they frequently distract the attention of the driver of a motor vehicle. While no statistics can be cited in support of this statement there can be no doubt that the situation is likely to get worse, in case there is no control over such signs. Before any hard and fast rules are laid down in regard to them, there appears to be a case for some standards being followed on a voluntary basis by common consent. In this connection attention is invited to the following two sets of suggestions recommended by the Conference of Roadside Business and Property Groups, one for adoption by the trade on a voluntary basis and the other for purposes of legislative and administrative action by the National Roadside Council of the United States of America.

A. For adoption by the trade on a voluntary basis.

(i) Outdoor "advertising" should not be placed on public or private property, without a lease or the consent of the owner thereof.

(ii) It should be maintained in good condition and all obsolete, faded or dilapidated hoardings should be reconditioned or removed.

(iii) No outdoor "advertising" should contain anything offensive to public morals or decency.

(iv) It should be located and maintained in conformity with the local laws.

(v) Outdoor "advertising" which does not permit of a proper perspective, whether at a Railway station or a highway inter-Section or a curve should be removed or located afresh. Where there are specific State laws on this subject such laws should be observed.

(vi) It should be so placed as not to interfere with or resemble official road signs or traffic signals.

(vii) Illumination of outdoor "advertising" should be so installed and maintained as to eliminate any glare to motorists.

(viii) In the placement of outdoor "advertising", 'clustering' or 'nesting' is to be avoided.

(ix) It should not be erected or maintained in scenic or protected areas, as determined by the Voluntary Roadside Improvement Committees in the respective States.

B. For legislative and administrative action by the National Roadside Council.

(i) All private structures or non-official signs on the right-of-way of highways should be removed.

(ii) The number of signs at a commercial establishment should be limited to two.

(iii) No free standing signs of any type should exceed fifteen feet from the ground in height.

(iv) No sign of any type should be erected on the roof of any building so as to be silhouted against the sky.

(v) No flashing or moving signs of any type should be permitted in view of the motorists, excepting danger signs or traffic signals.

(vi) The use of red or green lighting signs or reflectorised paints on signs, should be prohibited except for danger or traffic signs, signals or devices erected by the public authority.

(vii) All signs at intersections, inter-changes, grade separations and traffic circles, should be prohibited except those erected by public authority in the interest of traffi direction and safety, or business signs on property where the advertised product is sold or produced.

(viii) Bill boards should be permitted only in commercial districts concentrated in selected zones.

(ix) The "Clustering" or "nesting" of bill boards should be prohibited.

6.16. A summing up

Now that we have come to the close of our labours, let us once again go over the ground we have covered and see if it presents any salient features fit to be highlighted. That the problem of road safety is one demanding urgent attention all round, admits of no doubt. The question before us simply is, what can be done to tackle it. But here comes the rub in that there are countless obstacles that come in the way of any rough and ready solution of it.

In spite of the developments that have taken place in this country within recent dates, unfortunately, it still continues to be primitive in many respects as compared to current standards. For instance, most of our highways and bye-ways having been built at a time when fast moving traffic was unknown, are both out-dated and out-moded for present-day requirements. The position is further complicated by the fact that in the days when most of our existing townships sprang up there were no Town Planners as such. Consequently their interiors present a maze, to negotiate which successfully on any fast moving vehicle, no ordinary skill is required on the part of its driver. What is more, in the present day conditions, perhaps only a superman would be in a position to re-model them suitably not taking into account considerations of the cost involved in it.

Then there is the problem of mixed traffic that stares us in the face. It is so, because of our poor economic conditions when bullock-carts, 'thelas', push-carts, bicycles and cycle-rickshaws have, perforce, to share the road with limousines of the latest models.

It may be recalled that no less a person than Shri C. Rajagopalachari was once pleased to dub this as the 'bicycle age' for our country. The hard fact is that while their number is ever-increasing, no provision can possibly be made within our slender financial resources for a separate track for them, howsoever much this may be necessary.

In addition to these bicycle tracks, we need foot-paths in a big way for our pedestrian traffic. But unfortunately, even where they exist, they have been rendered ineffective by numerous other claimants for their use. such as pedlars, hawkers, stall holders and the like, to dislodge whom, a crusade of gigantic proportions would be required. And even if this were possible, they would have to be provided with alternative accommodation which, again, is bound to present a stupendous problem.

Unquestionably, what is really called for to ensure road safety, is not a little tinkering here and a little there, but a bold step forward. Meanwhile, we have to rest content with merely some selective measures which may help to set the ball rolling.

First and foremost, an awareness has to be created, both in official and non-official circles, of the urgent need for improvement of our traffic conditions. This can be done only with the organization of bodies of men at various levels, charged with the responsibility of doing what they can in this direction.

Next, arrangement has to be made to find adequate resources for the implementation of all road safety measures, including a radical improvement of the geometrics of all our roads. In addition, provision has to be made for the segregation of slow and fast moving traffic.

The establishment of truck terminals, with adequate arrangements for the storage and handling of goods, at the outskirts of all our cities, is another crying need of the day and so is education of the masses, particularly children, in road safety.

There is also a case for simplification of the procedural law in relation to traffic violations.

Above all, greater vigilance is called for on the part of the enforcement authorities, not only to bring all traffic offenders to book, but also to attend to the preventive aspect of this vital problem of road safety.

While in this summing up we have touched upon only a few salient features of our report, in order to bring them to special notice, we are anxious that our recommendations, inadequate as they may be, should be treated as a whole, for implementation.

To conclude, if there was ever a case for a stitch in time, there can be no better sphere than this for its application.

CHAPTER 7*

ROAD ACCIDENTS IN HILL AREAS

7.1. Introduction

7.1.1. General

The problem of safety on hill roads is quite akin to that on roads in the plains, except for a few distinctive characteristics. Since the main report has dealt at length with factors of the road, the road user and the vehicle, in this section only such aspects or considerations as merit special mention, are included. Amongst the above three factors, characteristics of the road have a very significant contribution to make to the performance of vehicles as well as the behaviour of road users. Hence, a study of the background of the present condition of our hill roads is necessary.

7.1.2. Old Hill Roads

Like the roads in the plains, construction of the hill roads in this country also dates back to several hundreds years ago when they were required to cater to the requirements of foot and animal traffic and at times to animal-drawn traffic. With the advent of motor traffic in the early years of this century, such of the hill roads as served as access to health resorts or pilgrim centres or commercial activities like mining, tea and such other plantations, came to be gradually improved to meet the needs of motor traffic. Arising from the difficulties of construction and the high cost involved, the improvements were mostly marginal allowing for low speeds and requiring arduous manoeuvring at many locations on account of steep grades and hair-pin bends. Quite a few hill roads are still in a far from developed state.

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*This chapter constitutes the report of the Sub-committee of the Study Group, on road accidents in hill areas,

7.1.3. New Hill Roads

During the last decade, the need for developing strategic roads along the frontiers of our country and also for the development of all hill areas in the Himalayas gave a spurt to the construction of hill roads and they have won the acclaim of all for the skill and courage displayed by the men who made them. Even these roads have certain deficiencies of geometrics owing to difficulties of their terrain and their high construction costs. Most of these roads have a formation of 6 metres in width with a firm pavement of 3.5 metres only. Barring a few exceptions the roads are intended to carry vehicles of restricted sizes and weights, consistent with the standards of the bridges along them.

7.1.4. Nature and Volume of Traffic

Most of the new roads and some of the old ones after they have been improved, when opened to traffic, are often required to carry vehicles of much bigger sizes and weights than is good for them. This is because of pressing demands of the local public, whose prosperity depends on these single lines of communication. A trial run is made on the route with a bigger size of vehicle than is permissible and representatives of the Transport, the Police and the Engineering Department are taken on it to satisfy themselves about its fitness for such a vehicle. Thereafter subject to some minor improvements the route is thrown open to the public, who are not always mindful of the restrictions and run the risk of accidents.

Though the volume of traffic along many of the hill roads, is relatively lower than on roads in the plains, their seasonal traffic of pilgrims far exceeds the capacity of all the available transport vehicles with the result that they are often over-loaded. During these periods additional vehicles are also pressed into service with casual drivers who are not sufficiently familiar with the road conditions. Then there is the traffic of tourist cars and buses which is of a considerable volume. On certain hill roads which cater to the movement of forest produce like timber and bamboos, additional hazards are created because of the vehicles having large overhangs. In short, the use of over-sized and overloaded vehicles and the influx of drivers not familiar with the road conditions in hill areas present a special problem of safety on them.

The lack of safety on hill roads is very much highlighted by the number of accidents to public transport vehicles in which a relatively larger number of lives are lost as compared to similar accidents on roads in the plains. A proper appreciation of the impact both individually and collectively of all the above factors is, therefore, called for to tackle the problem of road safety on hill roads.

7.1.5. **Factors of Hill Road Usage**

The standards of design for hill roads impose an undue strain on the vehicles using them. While going uphill, they are necessarily subject to a higher rate of mechanical wear and tear. In going downhill, there is the constant problem of controlling their speed. In fact, the accident hazard is greater driving downhill, unless the safe driving practice of using a low gear is followed for the occasion. Brake failure also adds to such hazard.

Besides the design deficiencies of the road and operational difficulties of the vehicle, a number of adverse natural conditions like rain, snow, fog (common to many roads) and others like land slides, flash floods, rock falls and avalanches create further accident hazards.

7.2. **Causes of Accidents**

The causes of traffic accidents on hill roads are more or less similar to those in the plains. They can be broadly classified under three heads, namely; (*i*) the human factor, (*ii*) the condition of the vehicle and (*iii*) the condition of the road.

7.2.1. **The Human Factor**

7.2.1.1. **Overspeeding**

An appreciable number of accidents on the hill roads is caused by rash and negligent driving on the part of drivers of motor vehicles, especially buses and lorries. According to the Bus Accident Enquiry Committee, set up by the Government of Uttar Pradesh in 1961, in four out of the five serious bus accidents which took place on the "yatra" routes to Badrinath, Kedarnath and Gangotri during June and July, 1961, overspeeding was a causative factor. Driving at excessive speeds while negotiating curves and corners, results in the vehicle going out of control. Wherever the Sub-Committee went in the States of Himachal Pradesh, Uttar Pradesh, Tamil Nadu and Mysore, it was pointed out to them that many of the accidents occurring on their hill roads could have been avoided if the driver had exercised caution and restraint and observed prudent speeds, whilst driving on them. This had also been brought out in the Magisterial Enquiries conducted to investigate the causes of these accidents.

7.2.1.2. **Drunkenness and driving under Fatigue**

Some of the drivers on hill roads being in the habit of driving under the influence of intoxicating drinks and drugs, do not realise the consequences of their irresponsible actions. At times, they drive for hours at a stretch, with disastrous results.

7.2.1.3. **Driving Lapses**

Lack of experience in driving on hill roads with steep ascents, descents and sharp bends, want of road and traffic sense, failure to give audible warnings at blind curves and corners and the driving of vehicles by persons without valid driving licences are a few of the other contributory causes of accidents.

7.2.1.4. **The Enforcement Authorities**

Inadequacy of staff and the lack of modern equipments to support enforcement efforts, come in the way of the preventive measures being effective. Since there is no regular patrolling of the roads by the Traffic police, the traffic rules are flouted with impunity, giving rise to conditions leading to accidents. There is also no check on the hours of duty of the drivers.

7.2.2. **The Vehicle**

7.2.2.1. **Mechanical Condition**

The poor mechanical condition of the vehicles plying on hill roads contributes to the incidence and severity of the accidents occurring on them. In addition, sometimes bad steering combined with poor and ineffective brakes results in the driver losing control over his vehicle. What is more, the proper maintenance and timely repairs of vehicles suffer, for want of good workshops and genuine spare parts and accessories of the required standards in the hill areas.

7.2.2.2. **Overloading**

To make matters worse, there is much overloading of both goods vehicles and passenger buses in many hill areas. What to say of putting down this evil, the Sub-Committee was told in Chamba that there is official sanction for wayside overloading of goods vehicles to the extent of 10 per cent of the permitted load and of a public bus in case it happens to be the last one leaving a stand and there are some passengers left to be accommodated.

7.2.2.3. **Size**

Apart from their condition, the size of the vehicles plying on these roads also affects their safety. The height of a vehicle should be in consonance with its wheel base. It has been noticed that metal bodies are fitted on to ordinary jeeps for the carriage of luggage on the roof which makes them top heavy and so easily liable to toppling over at a curve.

7.2.3. **Road Conditions**

7.2.3.1. **General**

The condition of the road is an important factor in regard to accidents. The hill roads are generally too narrow to permit of vehicles from opposite directions to pass one another in ease and safety. They abound in sharp hairpin bends that are dangerous. The absence of adequate warning signs is also a great handicap to drivers, especially to those not familiar with the twists and turns of these roads. The stacking of construction materials at odd places and failure to have warning signs for such obstructions provide a further source of accidents and so do unlighted bullock carts and bicycles, stray animals, slippery surfaces during the wet season, land slides and fallen trees. Failure to remove from the road the loose stones used by the drivers to hold the parked vehicles in position, at times gives rise to accidents. Where the roads do not have parapet walls or where such walls are broken, there is the risk of vehicles falling down into the deep ditches on the wayside. Sudden changes in weather conditions, giving rise to mists and fogs, reduce visibility, while heavy rains cause flooding of the road and thereby skidding conditions resulting in accidents.

7.2.3.2. Lack of Facilities

Wireless and telephone facilities are lacking on these roads. As a result, in the event of accidents or breakdowns of vehicles, medical facilities and assistance cannot be secured promptly.

7.2.3.3. Road-side Liquor Shops

The licensing of liquor shops along these roads is a great hazard. In all the States visited by the Sub-Committee this has been highlighted as an accident-producing factor, both by officials and non-officials.

7.3. Recommendations on Engineering Measures

7.3.1. Design

In relation to design there is a need for strict compliance with the prescribed standards of cross-section, grade and curvature, consistently with the speed of traffic. Adherance to the following policies in design would add considerably to safety on the hill roads.

7.3.1.1. The minimum permissible radii, along with limiting and exceptional gradients, should be reserved only for unavoidable difficult situations.

7.3.1.2. There should be harmony and uniformity in the design of the curves in the alignment. Series of sharp curves in continuous stretches should be avoided. Abrupt changes of curvature either from the straight or from easy curves to ones of short radii should not be made.

7.3.1.3. Road alignment should be streamlined so that there are no sharp kinks or corners presenting an element of surprise. For instance, there should not be any sudden variations in formation width from point to point.

7.3.1.4. Reversal of alignment or the presence of 'S' curves is very undesirable but as they have often got to be resorted to in hill roads, they should be limited to the minimum.

7.3.1.5. Transition curves as well as shock-free vertical curves should be used to avoid jerky movement of vehicles.

7.3.1.6. Widening at curves should be adequate for off-tracking of the biggest vehicles moving either way.

7.3.1.7. All horizontal curves should be carefully aligned with super elevation provided as per prescribed standards.

7.3.1.8. Visibility at horizontal curves should be improved by cutting sight benches, in accordance with stopping sight distance requirements.

7.3.1.9. Design and construction of hair-pin bends must be given special care so that they fulfil the design requirements of minimum radii, carriageway width, grades, super elevation etc. specific to them.

7.3.2. Other Safety Features

Besides the above design requirements, the following additional feature for the road are considered necessary :

7.3.2.1. On stretches having long descending grades, consideration should be given to the provision of speed-breaking ramps at strategic locations for runaway vehicles. Such ramps are quite popular abroad, as in Australia. The bed of these ramps is made of loose sand/aggregate.

7.3.2.2. For roads having smaller formation width, passing zones, 30 to 40 metres long and at intervals of 500 m, are a must to reduce accidents. These must be suitably sign posted (See the main report for details).

7.3.2.3. On sections of roads having long ascending grades where drivers would like to stop mid-way to relax or give rest to vehicles, special laybyes must be constructed so that there is no overcrowding of the normal carriageway on that account.

7.3.2.4. In extreme cases, where the available carriageway width is considered unsafe for two-way traffic, one-way regulations or gate system should be enforced in the interest of safety.

7.3.2.5. Proper sign posting and their regular maintenance deserve much greater consideration on hill roads for preventing accidents.

7.3.2.6. All signs and notice boards should be installed absolutely clear of the roadway, and ahead of the situations necessitating them.

7.3.2.7. On bends, it is important that the carriageway be divided into two parts by centre line markings. These need not be long. Usually, three/four strokes would suffice. From the point of view of easy maintenance, instead of paint, these could be made of materials like aluminium or plastic studs or precast concrete blocks. In extreme situations, the blocks could be made of stone also, provided care is taken to see that these are not more than 2 to 4 cm. "proud" of the carriageway surface.

7.3.2.8. Delineators of glass or reflectorised sheeting should be provided at strategic locations for the facility of night traffic.

7.3.2.9. Objects adjacent to the carriageway which could be a source of accidents in the case of vehicles leaving the carriageway should be painted in black and white stripes. These include parapet walls, guard stones, etc.

7.3.2.10. Safety slogans along the route should be sparingly used so as not to distract unduly the attention of the drivers.

7.3.3. Protective Measures

Since the protection of the road formation and side slopes is also necessary for the safe use of the road, due priority should be given to the following protective measures :

7.3.3.1. Plantation

Preventive steps should be taken along side slopes to preserve the ground cover of vegetation and trees, where their removal is likely to result in washouts and earth slips, endangering the road. As far as possible, hill slopes should be stabilized by afforestation.

7.3.3.2. Breast Walls

These should be liberally provided at all points of instability of side slopes, so that the roadway is kept clear of the slip material from the hill side of the road. Likewise the valley slopes should also be provided with suitable retaining walls, where they are required.

7.3.3 3. Terracing

On long side slopes and valleys susceptible to erosion, particularly in regions of high rainfall, terracing by construction of suitable masonry or other bunds should be carried out, extending to the highest reaches.

7.3.3.4. Shelters

Along regions of frequent rock falls and snow drifts interrupting traffic flow, the road way should be protected by suitable shelters to protect it and the traffic.

7.3.3.5. Snow Fences

These should be provided along the side slopes where strong winds may cause snow drifts towards the roadway.

7.3.3.6. Dips

Where the road formation is firm, dips on the roadway provided to carry surface drainage should be paved with concrete to allow safe passage of traffic.

7.3.3.7. Drainage

Longitudinal drainage should be properly arranged by suitable selection of gradients, so that surface water is prevented from flowing along the road surface and is properly led on to the cross drainage structures. Suitable culverts which will not be blocked by floating debris, bushes and trees should be provided so that blockage of stream flow will not endanger the road formation and riding surface.

7.3.4. Normal Maintenance

In view of the high rate of wear of the road surface, due to the braking of vehicles on steep grades and their turning manoeuvres along curves, a higher standard of maintenance is warranted for hill roads than for roads in the plains. As the road condition influences the driver behaviour and hence his safety, these measures should be more prompt in their implementation and of a higher standard. The various measures of maintenance are dealt with in the main report.

7.3.5. Emergency Maintenance

Besides the normal maintenance, emergency maintenance for the clearance of slides, rock falls, snow, etc. should be very prompt and carried out with proper equipment. Unless an adequate width of the roadway is cleared to permit of the safe movement of vehicles, they should not be allowed to negotiate such locations. Such operations should be preceded by ample advance warning to discourage traffic from approaching such locations and getting stranded over long periods.

7.4. Special Enforcement Requirements

7.4.1. Driver

7.4.1.1. Special Endorsement on Licence

Driving on hill roads calls for experience and a high degree of driving skill. Besides a knowledge of the common traffic rules, a working knowledge of the vehicle and its functioning would be an advantage to the driver. When confronted with an emergency, he should be cool and should display presence of mind in dealing with the situation. Besides, it also calls for physical stamina of a high order with all the reflexes intact. The Sub-Committee, therefore, is of the opinion that in the case of heavy passenger and goods vehicles, only those whose heavy vehicle licences are endorsed for driving on hill roads, should be allowed to drive on them. Before making the endorsement, the Licensing Authority should satisfy itself about the applicant's ability and qualifications for driving on such roads.

7.4.1.2. Hours of Duty

The tendency of these drivers to be at the wheel for long hours at a stretch, should be curbed. They should not exceed the 8 hour duty prescribed by law. In case of infringement of this law, the driver concerned as well as his employer, should be brought to book. The law relating to hours of duty should be applicable even to single vehicle owners who at present take advantage of a lacuna in the law in this regard and go scot-free when detected.

7.4.1.3. Rest Rooms

In order that drivers may not overstrain themselves, there should be rest rooms with toilet facilities on the way-side where they can stop and rest their tired limbs. Such rooms should provide facilities for recreation, like indoor games, newspapers and radio. Besides, a relief crew should be stationed at suitable places to replace the bus crew on duty, if a vehicle has to run beyond 8 hours.

7.4.1.4. Intoxicants

Although the existence of liquor shops along the hill roads is an open invitation to the driver of a vehicle and its operating crew, they should resist the temptation of taking any liquor whilst on duty. In case, they are callous enough to ignore the call of their conscience, strict action should be taken against them, if they are found driving whilst under the influence of intoxicants. No wayside liquor shops should be licensed.

7.4.1.5. Special Training

The drivers wanting to operate on hill roads should undergo a recognised course of special training to get themselves fully equipped for the hazards involved. Special emphasis should be given in the training, on action to be taken during skidding or against running off the road. Only those who have undergone this training should be eligible to apply for the special 'Hill Roads' endorsement on their licence. Persons holding licences thus endorsed should undergo and pass periodic medical tests to determine their physical fitness to drive on these roads.

7.4.1.6. Free Wheeling

The practice of driving downhill in neutral gear should be treated as an offence.

7.4.2. The Vehicle

7.4.2.1. Age

In view of the strain on vehicles plying on hill roads, there is a rapid deterioration in their mechanical condition. It is, therefore, necessary that vehicles exceeding a certain age should not be allowed to ply on them. In the U.P. and Tamil Nadu, a suggestion was made that public carriers and passenger buses over 5 years old should not be allowed, while in Himachal Pradesh, it was pointed out that vehicles which had run 1,50,000 miles should not be allowed to operate on their hill roads. As the mileometer is not tamper-proof, the age of the vehicle, rather than its mileage, should be the basis for any restriction and we recommend that vehicles older than five years, generally, and in any case not more than seven years, should be prohibited on the hill roads.

7.4.2.2. Mechanical Tests

It is understood that in some States at present heavy transport vehicles operating in hill areas are subject to their passing mechanical tests every six months. These tests should be made more rigorous and thorough than they are at present and should be followed uniformly by all States and supplemented by surprise checks to ensure that only fit vehilces operate.

7.4.2.3. Size of Vehicles

One factor affecting the safety of motor vehicles is their size. The Bus Accident Enquiry Committee set up by the U.P. Government in 1961 recommended that since the hill roads are narrow, the width of buses plying on them must not exceed the width of the rear axle, including tyres by more than 7.5 c.m. Nor should the overhang of the body, at the back of the rear axle, be more than 45 per cent of the wheelbase. It further suggested that the rear of the body should be tapered to make the vehicle more manoeuverable. While commending these observations the Sub-Committee further recommends that the driver's cabin in the buses should be separated from the accommodation for passengers so that he can concentrate on driving, without interference from them.

7.4.2.4. Overloading

The overloading of buses and goods vehicles which results in serious accidents should be dealt with severely by suspending their registration and the driving licences of the offending drivers. The strength of the enforcement staff should be proportionately increased and they should patrol the roads on a regular basis to detect overloading and other traffic offences. One of the handicaps of the authorities, in this regard, is the lack of equipments to aid detection such as portable weighing machines and instruments for detecting speeding. The patrol staff should be provided with these equipments and also motor cycles to make their presence more effective. Overhangs of loads on vehicles in excess of the regulation for horizontal and vertical dimensions of vehicles should not be permitted. Where such loads have to be moved, suitable measures such as restricted time for their movement, advance warnings, etc., should be taken.

7.4.2.5. **Chocks and Reflectors**

To eliminate the practice of using stones to keep the vehicles in position on slopes which, if left uncleared on the roads act as obstructions, it should be compulsory for heavy transport vehicles to carry chained wooden chocks which may come in handy when the vehicles have to stop at an incline. Coupled with the chocks it will be advantageous if the vehicles carry reflectors to make them visible at night. In fact, the reflectors should be compulsory fixtures on all vehicles including bullock carts.

7.4.2.6. **Lay-Byes and Breakdown Towing Vans**

A broken down vehicle on a hill road, sometimes, has the effect of blocking the entire traffic until it is possible to remove it to a nearby lay-bye or parking place, where available. In the absence of such parking places, it should be the endeavour of the authorities to create them along the flanks of the road where it can be widened suitably. Breakdown towing vans fitted with cranes should also be stationed at convenient points from where their services can be requisitioned for vehicles suffering breakdowns or damage in accidents.

7.5. **Miscellaneous**

7.5.1. **Wireless Traffic Aid Posts**

Just as there are Wireless Traffic Aid Posts in Maharashtra, on hill roads, too, there should be such posts or stations, both at the foot and the top of hills and also at intervals in-between. Such stations will not only help to keep an eye on the traffic but also in the despatch of quick reports of accidents, and of prompt medical aid besides giving timely warning of approaching floods or changes in weather conditions. The provision of telephone booths on the roads will be an added benefit to road travellers.

7.5.2. **Repair Facilities**

Repair and servicing facilities, including fuel filling stations, are essential requirements which should be made available at reasonable intervals to facilitate the free flow of traffic. There are complaints that there is a dearth of these amenities, affecting proper maintenance of the vehicles plying on these roads and that in the event of fuel shortages it takes a long time to get the supply replenished for want of petrol pumps within a reasonable distance.

7.5.3. **Look Outs**

Many of the hill roads abound in places of extreme scenic beauty where the traveller might wish to stop and have a look around to feast his eye. There should be scenic look-outs constructed at such spots where the visitor can relax, with sufficient space to permit parking of a few cars at any one time.

7.5.4. **Stacking of Construction Material & Equipment**

Stacking of road metal and other construction equipment should always be done on the valley side of the road formation where adequate width is available, without encroaching on the minimum roadway required for the movement of traffic.

7.5.5. **Water Supply**

The roadway should be widened near sources of water, to facilitate the parking of vehicles clear of the roadway for topping up or change of water. The locations should also be indicated by road signs and arrangements for supply of drinking water should also be made.

Sd/-
(Tulshidas Jadhav) (R. P. Sikka)*
Sd/- *Sd/-*

(N. S. Srinivasan) (C. L.N, Iyengar)
Sd/-

(U. S. Anand)* (K. G. Subramanian)

NEW DELHI

29-6-1972

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*Consent taken.

CHAPTER 8

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Causative Factors in Highway Accidents

1. In order that oncoming vehicles are not handicapped by the dazzle of headlights, it should be obligatory that as the two vehicles approach from opposite directions, the main beam is switched off and dipper used instead, to enable them to pass each other in safety (3.1.1.4.).

2. Driving licences should not be renewed automatically. After a certain age, the applicants should be subjected to tests regarding their vision, reaction time, colour blindness and hearing. Only on passing them, their licences should be renewed (3.1.1.5.).

3. The hours of work prescribed by Law applicable to drivers of commercial vehicles are seldom observed or enforced. The rules in this connection should be respected both by the person in charge of the vehicle as well as by its owner. The authorities, on their part, should see to it that the relevant provisions are strictly enforced (3.1.1.6.).

4. Overspeeding by commercial transport vehicles for any reason whatsoever should not be condoned; on the contrary, it should be put down with a stern hand (3.1.1.7.).

5. The manufacturers of motor vehicles should be required to equip their vehicles with safety fittings like seat belts, collapsible steering columns, padded dash boards without any protruding knobs, wing mirrors and safety glass windshields. They should improve the quality of the vehicles which should conform to accepted standards in countries where the industry is highly developed. The accessories and fittings used should be of high class material to give a reasonably long life and good performance (3.2.1.).

6. Adequate facilities for repair and maintenance of motor vehicles should be available to ensure their road-worthiness (3.2.2).

7. A significant reduction in the severity and frequency of road accidents can be effected only if the roads and regulations for their use are made to fit in with the traffic conditions and the known patterns of human behaviour. The other requirements are a detailed analysis of every accident to establish its causative factors followed up by a collective analysis for improvement of design standards, maintenance practices, traffic regulations and control, besides correction of local conditions (3.3.).

8. The geometric design standards of the Indian Roads Congress would require to be enlarged to account for traffic types and volumes as determinants for varying the standards for different classes of roads. Since the up-grading of the roads to these design standards fully, would take a long time at the current rate of spending, there is also a case for developing tolerable standards for meeting the immediate needs of traffic. In this connection, the accident data for different roads should also be one of the considerations (3.3.).

9. The minimum requirement for safe operation of traffic along the main rural highways is a paved width of 7 metres for two lanes. Since a very large length of these roads is still of a single lane width of 3.5 m and sometimes even less, it is very necessary in such cases that the condition of the shoulders should be improved to make them firm so that even during the rainy weather, vehicles which have to use them may do so safely. Such firm shoulders should be of a minimum width of 1 m on either side (3.3.1.2.).

10. In the case of roads with paved widths widened in stages to non-standard widths of 5-6 m, a centre line marking should be provided to keep the opposing directions of traffic to their proper side (3.3.1.3.).

11. Wherever isolated short curves exist along main highways with limited sight distances, realignment of the road to avoid them should be taken up. Where this is not possible, speed restrictions should be imposed and such locations should be marked with over-sized warning signs well ahead of them. They should also have central line markings preferably with a reflecting type of markers (3.3.1.4.).

12. For road junctions along rural roads, particulary those occuring at long intervals, measures should be taken to maintain proper sight distances, if necessary by flaring the width of the side-roads and clearing off all sight obstructions. In addition, proper warning signs should be posted on both the main and the side roads. Where there is heavy night traffic, the junction should be either illuminated or have blinkers (3.3.1.5.).

13. Locations along main roads where the road surface is likely to be slippery either through wear or other causes should be identified and adequate warning signs posted ahead with a recommended safe speed (3.3.1.6.).

14. Under the existing conditions, a liberal use of road signs is the easiest way to encourage safe road use. Such signs should be made uniform throughout the country by adopting those standardised by the Indian Roads Congress. These signs being symbolic are easily understood. Wide publicity should be given to these signs to improve their effectiveness (3.3.1.7.).

15. Rural highways on their approach to urban areas, should be widened upto a reasonable length to permit of segregation of different types of traffic including pedestrians. Such approaches should also be provided with street lighting (3.3.1.8.).

16. All unmanned railway level crossings should be provided with gates and manned. Where the number of trains at such crossings is more than 12 per day or where the road traffic exceeds 500 vehicles per day, either over or under bridges should be provided. Where rail crossings cannot be seen from a reasonable distance, warning signs should be provided well ahead of them. The road surface at such crossings should be kept in good condition (3.3.1.9.).

17. Where narrow bridges occur, advance warning signs should be prominently located and the ends of the parapets should be painted preferably with reflectorised paint for good visibility at night (3.3.1.10.).

18. Since the presence of stray cattle or cattle herds being driven along main rural highways constitute a serious hazard to fast moving traffic, measures should be taken where accidents from this cause are frequent, to keep them away from the main road. Where the need for leading large herds is essential, separate tracks should be provided on the roadsides for them (3.3.1.11.).

19. For maximum utilisation of urban road space, the roadway surface should be properly paved from kerb to kerb and lane markings provided for guidance of slow and fast moving traffic. Strict enforcement should be combined with the above to ensure segregation of mixed traffic. Where found impracticable, measures should be taken to restrict the use of the road to fast moving traffic in peak hours and for the gradual elimination of slow moving traffic (3.3.2.1.).

20. Footpaths should be freed of all encroachments and provided with a good surface to encourage their use by pedestrians and prevent them from straying on to the road. They should be of adequate widths to meet pedestrian demands and should not be cut into for widening of the roadway indiscriminately. The illumination of the road should also cover the entire footpath (3.3.2.2.).

21. Pedestrian crossings should be properly located and marked and regularly spaced to encourage their voluntary use. On minor streets also such pedestrian crossings should be better illuminated than the rest of the road (3.3.2.2.).

22. Under the conditions of high volumes of mixed traffic, separate routes for different types of traffic, restricted time regutions, and diversion of obsolete forms of transport to mofussil areas have all to be resorted to, to reduce accident hazards and provide for efficient movement (3.3.2.3.).

23. Standards should be formulated by the Indian Standards Institution for the road traffic signals, their location and operation, their components, their degree of illumination as well as for the types and sizes of their reflectors. Signal heads of turning arrows should not be avoided, from considerations of cost. Where the turning movements are heavy these have to be regulated by these turning arrows (3.3.2.4.).

24. Parking along main roads in urban areas should be regulated by proper markings, time restrictions, and use of parking meters. Where parking leads to undue congestion of moving traffic, it should be prohibited and recourse should be had to off-street parking either in separate lots or multistoreyed garages. The location of these facilities should provide for easy access to them from the main road. They should also be within reasonable walking distance of the destinations of the users thereof (3.3.2.5.).

25. Bus stops and loading and unloading zones should be so located along urban roads as not to interfere unduly with traffic movement. Wherever possible, suitable lay byes should be created by the roadside for them. Appropriate regulations to restrict the use of loading and unloading zones to accommodate peak hour traffic should also be enforced (3.3.2.6.).

26. Big traffic generators like cinemas, theatres, super markets etc. should not be authorised along roads without prior investigation of the possibility of satisfactory traffic movement on the adjoining road system following their construction. A feasibility study of traffic factors should precede the preparation of such projects (3.3.2.7.).

27. In single lane rural roads carrying large volumes of traffic in opposing directions, till such time as their widening is taken up, passing zones of 30 to 40 m length by widening them to two lanes should be created at intervals of every 500 m or so, so that most of the drivers use such widened areas for crossing and overtaking (3.3.1.14.).

28. Roadside trees and other vertical obstructions should be gradually removed over widths of 10 m from the pavement edge along heavily trafficked sections of national and State highways and substituted by plantings beyond the above widths. In addition, the slopes of the embankment should be eased to 1 in 6 or more to act as a recovery area for vehicles straying off the carriageway. Like the roadside trees, utility poles, sign posts and milestones should also be kept away from the road by similar clearances. Construction equipment, storage of road construction material, etc. have also got to be avoided over hazard areas and removed to the roadsides beyond 10 m (3.3.1.13.).

29. An Indian standard for kerbs should be developed so that those of proper sizes and shapes are used at the required places. For good night visibility they should be properly painted or made of the reflecting type (3.3.2.8.1.).

30. Channelising islands should be designed by qualified traffic engineers to reduce the area of conflict at intersections. Where, in public interest, large traffic islands are used for other purposes, warning signs for them should be put up on the approach streets. Experimental arrangements should also be made with portable lightweight kerbs so that they reflect correctly the efficiency of the final arrangement (3.3.2.8.2.).

31. Medians should be as wide as possible. They should not be used for very narrow roads. Where narrow medians are used, the lengths of gaps should be such as to permit the turning vehicles to stop in them without conflict with through movement (3.3.2.8.3.).

Role of Different Agencies in Highway Safety

32. The Police personnel investigating accidents should be fully trained and adequately equipped for an analysis of their causes. The traffic police should keep a continuous record of accidents and mark their locations on a map to identify the black spots and take suitable remedial measures. Their final report in any particular case should mention in sufficient detail all contributory causes such as the condition of the road or of the vehicle or of the driver responsible for the accident (4.1.).

33. It is necessary for all States to emphasize the Highway Safety aspect of Police work by providing adequate personnel for it, apart from improving the quality of their training, equipping them suitably for better mobility and providing them with more sophisticated instruments for the detection of speeding etc. Their working with reference to road safety should be reorganised to make it more thorough and expeditious. They should have sustained road safety programmes with adequate financial support (4.1.).

34. Inspectors General of Police in their fortnightly Crime reports to their respective State Governments should include a paragraph on road accidents and the measures taken to combat them. There should be a similar mention made by Chief Engineers of Public Works Department, in their periodic reports to State Governments (4.1.).

35. Through a more rigorous system of inspection of all motor vehicles and driver licensing procedure, the Motor Vehicles Department must ensure a traffic condition in which accidents arising from defective vehicles and the faults of drivers are minimised (4.2.).

36. Road construction and maintenance agencies should initiate special programmes for eliminating the causes of road accidents. They should make a proper investigation of the flow of traffic and of the incidence of road accidents with a view to suitable preventive measures being taken (4.3.).

37. Since a vast number of variables covering all the fields of planning, designing, construction and maintenance of highways enter into the picture of highway safety, highway engineers should be put through a special course of training to enable them to identify such factors and make the highways more safe for traffic (4.3.).

38. In large metropolitan areas, where the problem of increasing the available road space is beset with difficulties, effective traffic engineering remedies are required to supplement the enforcement measures for ensuring a reasonable amount of traffic safety. These engineering facilities should be provided in all cities having a population of over 1,00,000. Besides discharging their responsibility for the construction and maintenance of roads our Municipalities and Corporations should control the unlawful activities of pedlars, hawkers and others who indulge in the wrongful use of road space and its adjoining lands (4.4.).

39. The economic loss to the community due to traffic accidents should be evaluated properly and brought into a correct perspective if the influence of vested interests who pressurize the public authorities into allowing the misuses of road space is to be checked (4.4.).

40. Since much of the character of traffic on the highways is influenced by the types of land use, the Town Planning Department should ensure bigger land use divisions to reduce frequency of cross roads, elimination of frontage of properties and side walks along arterial roads and, locations of inter-zonal activities in the outskirts of the zones to eliminate through traffic from the interior roads.

These departments can function effectively, if besides being safety minded at the time of preparation of their plans, they are equally watchful that their original plans are not altered without thought at the time of redevelopment (4.5.).

41. The Education Department can educate the future generations in the proper use of the road by introducing highway safety lessons for different classes in schools (4.6.).

42. Road user groups, like the Automobile Associations, Transport Undertakings, Safety First Organisations, the Lions Clubs, the Rotary Clubs and the Junior Chambers of Commerce, among others, can play a big part by their efforts to encourage safety on the roads. A sustained message of highway

safety can be very effectively transmitted to the public through the Press, the Advertising Agencies, the Film Industry and Television. The media of these agencies should be employed more and more for educating the public in road safety and creating a proper road sense in them (4.6.).

Remedial Measures

43. Children below 12 years of age should not be allowed to ride a bicycle or drive any vehicle on public roads in Municipal areas (6.1.1.).

44. Applicants for a driving licence for a motor vehicle should possess a minimum educational qualification of fifth standard (6.1.2.).

45. Professional drivers should undergo successfully a course of training in a recognised driving school for a minimum period of at least 6 weeks (6.1.3.).

Wherever possible Government should run such driving schools (6.1.3.).

The instructors should be not only skilled drivers but must also be well-versed in teaching traffic rules and regulations, besides possessing a knowledge of motor mechanism and maintenance. They should be able to impart a sense of defensive and sportsmanlike driving to all the trainees (6.1.3.).

46. The driving test should be more rigorous. There should be an oral or written test, preferably both, to test the applicant's knowledge and awareness of road signs, road signals, road markings, common traffic rules, basic knowledge of motor mechanism and the safety factors including reaction time and braking distances (6.1.3.).

47. The road test should be conducted over a distance of at least 2½ kilometers and a duration of 25 to 30 minutes. It should embrace in its scope varying traffic and road conditions to bring out the driving skill and knowledge of traffic rules of the applicant (6.1.8.).

48. The driving test must also size up human personality in its physical and psychological aspects. The testing procedure should be phased. The determination of the physical capability of a driver should be followed by a reaction time test (6.1.3.).

49. The driver must be tested to judge his ability to attend to sound and light emerging from behind. He should be capable of receiving and reacting to movements within a range of 180° (6.1.4.).

50. The applicant should be examined to judge his ability to anticipate the relative size of a near and a distant object (6.1.5.).

51. A glare recovery test should be carried out to guage the applicant's ability in this direction (6.1.6.).

52. The application form for obtaining driving licence should contain a page listing the items for test. An applicant who fails in the test should be furnished with a statement of his shortcomings (6.1.8.).

53. The Union Ministry of Transport should bring out a detailed driving Manual, in English, Hindi and the regional languages (6.1.8.).

54. A "pass" in the driving test should entitle an applicant to a provisional driving licence only, valid for 3 years. If, during this period, the holder is involved in a serious accident and convicted his licence should be revoked and he should be given a fresh provisional licence only on his passing a fresh test. If, however, he has a clean record, the provisional licence should automatically get confirmed and he should be eligible to have it renewed under the normal rules (6.1.9.).

55. Photographs of all licence holders together with their signatures (both duly attested) should be affixed to their driving licences (6.1.10.).

56. Processing for the issue of a driving licence should be done in two stages. The applicant should first obtain a competence certificate of driving from the Transport Authorities. He should then present it to the Police Authorities for issue of the driving licence after such verification as may be called for. The renewal of a driving licence should also be done by the Police who, if the record of the person concerned is poor, may refer him to the Transport Authorities for a repeat driving test (6.1.11.).

57. Motor cyclists and scooterists holding learner licences should learn their driving only in open grounds and by-lanes, instead of along main road (6.1.12.).

58. The point system for dealing with traffic offenders should be introduced, to start with, in the large metropolitan areas of the country (6.1.13.).

59. A limit of blood alcohol content of 0.05 per cent should be fixed and a person exceeding this limit should be deemed as drunk. Action should be taken against a driver found having taken alcohol in excess of the limit by way of an endorsement in his licence, court fine, revocation of licence, as may be necessary, depending upon whether it is his first or repeated offence. Large-scale manufacture of an equipment similar to an alcohol meter of balloon type and its distribution among the Police Officers throughout the country, should be taken up to enable the Police to launch a determined drive against drunken drivers (6.1.14.).

60. The driver's skill in driving and physical fitness to drive. should be subjected to tests once in six years or more frequently If at the time of obtaining his licence, he wore glasses or used hearing aids or other devices, the validity of the licence should be conditional on the use of such aids by the holder while driving unless he satisfies the Licensing Authority that he no longer requires such aids (6.1.15.).

61. To promote good and safe driving, careful drivers should be encouraged. One with a clean record over a continuous period of six years should be issued a distinctive de luxe licence which he will forfeit the moment he gets convicted for a traffic accident (6.1.16.).

62. The employment of computer technique for maintaining records of drivers will enable enquiries about applicants for driving licences being dealt with promptly.

In the case of all drivers of motor vehicles involved in serious traffic violations, resulting in Court convictions, such information should be recorded in a National Driver Register (6.1.17.).

63. There is an urgent need for examining all the traffic regulations framed in the country and arriving at a set of basic uniform ones so that uniformity of their application throughout the country is achieved (6.2.1.).

64. Supplementing the basic uniform traffic regulations, a set of model ones for urban areas, covering the requirements of all modes of traffic, has to be formulated (6.2.2.).

65. Provisions of the basic uniform traffic regulations and the model traffic regulations for cities should be condensed in the form of a Highway Code and brought out in several regional languages in addition to Hindi and English (6.2.3.).

66. Separate Traffic Courts should be set up to try traffic and road accident cases, composed of Magistrates with a working knowledge of the automobile and a driving experience of at least five years (6.3.2.).

67. The Traffic Courts should be manned by full time Magistrates and they should have trained traffic Prosecutors assigned to them for dealing with violation cases. Persons charged with 'moving violations' should be required to appear before such courts in person (6.3.2.).

68. Traffic Courts should arrange to record the evidence deposed by witnesses on the very day they appear before them. The Courts should have summary power. The right of more than one appeal against their verdict should be disallowed (6.3.2.).

69. The Traffic Courts should give directions for a copy of the order of conviction being sent to a Central Licences Record Office to ensure completeness of its records (6.3.2.).

70. The persons accused of petty traffic offences should be given an option to plead guilty by a registered letter addressed to the Court and to remit to it such sum as may be specified in the summons, instead of having to appear before the Court (6.3.2.).

71. Accident Investigating Squads, consisting of high ranking officers conversant with the traffic laws and regulations, should scrutinise the facts of each accident reported and institute proceedings against those found to be at fault. Where such squads are not available, each Police Circle/Division, particularly in urban areas, having a high density of traffic, should have at least one Traffic Inspector conversant with the traffic laws and regulations (6.3.3.).

72. Mobile Courts assisted by Mobile Traffic Patrols should bring about effective enforcement of traffic regulations by dispensing on-the-spot justice to earring traffic offenders. They can thus reduce the work load on the regular courts and leave them free to hear cases involving serious offences while disposing of the minor ones themselves (6.3.4.).

73. The Law should prescribe in addition to a maximum punishment, a minimum punishment as well, in the case of all endorseable offences mentioned in the Fifth Schedule of the Motor Vehicles Act of 1939. The minimum punishment should be at least 50 per cent of the maximum laid down (6.3.5.).

74. Since the condition of a vehicle and its proper unkeep are essential to accident prevention, there should be a periodic inspection by the registering authority of the mechanical condition of all types of automobiles on the road and unfit vehicles should be kept off the road, till they are made road-worthy (6.4.2.).

75. Fitness tokens valid over prescribed periods should be issued and their display made compulsory to prevent vehicles in unsafe condition from operating on the road (6.4.3.).

76. For transport motor vehicles, the vehicle inspection should be made at intervals not exceeding a year and should also cover compulsory equipments such as horns, wipers, rear view mirrors, brakes, steering connections and suspension (6.4.4.).

77. For motor cars and motor cycles, the vehicle inspection should be performed and fitness certificate issued for periods ranging from 1 to 3 years depending upon the condition of the vehicle (6.4.5.).

78. A motor vehicle inspection code should be framed stating minimum standards of safety including braking performance. This should be supplemented by an inspection manual setting down standard procedures for the operation of vehicle testing stations (6.4.6.).

79. Vehicle inspection or testing stations should be established by the Government to work on a self-supporting basis by charging a fee. Where it is not possible to locate such stations at reasonable distances, mobile testing stations should be introduced (6.4.10.).

80. Spot inspection of vehicles considered unsafe should be carried out by a motor Vehicle Inspector or by a police officer of a rank not below an Inspector. In the case of vehicles found unsafe, a written order should be given to the owner/driver to obtain a fresh certificate of road worthiness within a week from the registering authority. The written order should indicate the extent of the inspection made (6.4.7.).

81. Compulsory periodic inspection should be applicable to all motor vehicles when they are three years old and above (6.4.9.).

82. Vehicles found defective at vehicle inspection should be given time to have the necessary repairs and adjustments effected before re-submission of the vehicle for further inspection (6.4.10.).

83. There should be a regular programme for checking the registrations of motor vehicles using the road (6.5.).

84. Uniformity in the display of registration marks facilitates identification of the vehicles. When registration marks are assigned, it should be obligatory for the owners of motor vehicles to obtain and display registration number plates, conforming to the prescribed regulations. Such number plates should be supplied either by the authorities themselves, or by an agency approved by them (6.5.).

85. When a motor vehicle changes hands, the transfer of ownership should be promptly entered in the records of the registering authorities (6.5.).

86. The responsibility for having the change of ownership entered within the specified period should be laid on both the purchaser and the seller of the vehicle (6.5.).

87. There is a need for standardising the height of head lamps from the ground level to minimise the glare effect on on-coming vehicles. In addition, the equipment should be immunised against operating the main and dipper filaments together (6.6. 1.1.).

88. The Indian Standards Institution should take up standardisation of head lamps and accessory light fittings so that the degree of illumination and the types of reflectors are adhered to by the manufacturers. In addition, there should be a total ban on other lighting accessories such as triangular illuminated red lamps on the rear wind screen and miniature signal heads (6.6.1.2.).

89. A fixed standard for the colour, size, and level of illumination of amber lamps should be developed so that they are effective for operation under foggy conditions (6.6.1.3.).

90. Use of safety helmets should be encouraged for the drivers as well as pillion riders of scooters and motor-cycles by allowing a higher rate of insurance compensation for such of them as were wearing such equipment at the time they were involved in an accident. Gradually their use should be made compulsory. Likewise, wearing of goggles protecting the drivers of motor cycles and scooters should be encouraged to prevent disturbances to vision from dust and insects. Rear wheels of motor cycles should be properly covered to prevent loose garments of pillion riders being entangled in the spokes of these wheels. Roll-over bars should be provided for all scooters and motor cycles to prevent body injuries in the case of over-turning. Rear view mirrors, stop lamps, and illuminated direction indicators should be made compulsory equipment for such vehicles. Riding by more than two persons or the transport of bulky goods should be disallowed on them. The feasibility of increasing the diameter of the scooter wheels should be examined to reduce their proneness to overturning (6.7.).

91. For school buses, metal bodies with low entrance and exit steps, grade handles and guard rails, separate driver's cabins seats facing the front and emergency doors should all be made compulsory (6.8.1.).

92. Illuminated direction indicators and rear view mirrors should be fitted compulsorily on all tempos and three wheeler rickshaws (6.8.2.).

93. Cat's eye reflectors and the use of lights during dark hours should be made compulsory for slow moving vehicles such as tongas, bullock carts and bicycles. Also where such vehicles ply on steep grades, they should be provided with suitable brakes (6 8.3.).

94. Zebra markings should be adopted for all pedestrian crossings. In addition, safety zones of about 20 meters length on either side of such crossings should be marked, where parking, halting and overtaking of vehicles should be prohibited. Where vehicular traffic is heavy, mid-block pedestrian crossings should be provided with push button signals. Pedestrians should be forced to observe traffic regulations and in case of flagrant breaches suitable fines should be imposed. On-the-spot action should be taken by mobile courts for traffic violations by pedestrians (6.9.).

95. All the requirements of road safety should be provided for, as far as possible, in the construction stage itself. During the course of construction also, safety measures such as the lighting of barriers, the provision of signs and good surfaces for diversions should be properly enforced (6.10.).

96. Prompt maintenance operations should take care of (1) all road surfaces including their shoulders, (2) repainting of the traffic lines and signs, (3) clearance of all obstructions to movement of traffic such as fallen trees and boulders, (4) removal of sight obstructions at junctions and curves and (5) timely warning of hazardous road conditions. Requirements of emergency maintenance under conditions of flood and land slides, should be planned in advance and adequate equipment and personnel made readily available for them (6.10.).

97. Street lighting in urban areas and other locations should be improved by augmentation of the resources for such schemes and by working out long term and short term plans for their implementation in a systematic manner (6.10.1.).

98. Wayside amenities along roads should be given early attention and the needed facilities provided. Telephones should be installed along busy highways at intervals of 15 to 20 km (6.10.2.).

99. For prevention of ribbon development alongside the national highways a Central legislation should be passed. For this purpose, the provisions of Articles 252(1) of the Constitution should be invoked whereunder the States concerned should pass necessary resolutions authorising the Centre to pass necessary legislation. The States also should make similar legislation following the pattern of the Central legislation for ribbon developments alongside the States highways (6.10.3.).

100. Bye-passes diverting the main highway traffic outside built-up areas should be provided and strict measures taken along such bye-passes to regulate road-side developments so that they do not interfere with the ease of traffic movement and also endanger safety (6.10.4.1.).

101. Ring roads should be planned and constructed for urban areas to divert inter-city traffic to peripheral areas. Their location and design should be based on a proper traffic survey allowing for future requirements of traffic (6.10.4.2.).

102. Truck termini with adequate arrangements for storage and handling of goods should be provided at the out-skirts of large urban areas to eliminate the movement of heavy transport vehicles inside them (6.10.5).

103. Well-planned programmes of education in road safety covering all road users should be drawn up and implemented (6.12.).

104. Road safety education of children should start right from the primary classes. In the initial stages, simple rules relating to the correct use of the road and the possible consequences of not observing them, should be pictorially represented to make a deep impression on their minds. This should be followed up by more difficult rules, assisted by educational aids like posters, cinema slides, cinema shots, slogans, models, comics and stories with road safety as their underlying theme. In the secondary stage a practical bias to the instruction can be given by a scheme of Roads Safety Patrols to make the youngsters disciplined road users (6.12.1.).

105. The establishment of Traffic Training Parks for children is a necessity. Such parks should be provided in all cities for children from all the schools in the neighbourhood to play traffic games (6.12.1.).

106. National propaganda through the Press and the Radio should also be aimed at parents to prevent children from using the road except in the company of responsible persons. Such a campaign should be supplemented by propaganda by the local unofficial organisations devoted to road safety (6.12.1.).

107. The Government of India should enunciate a national policy in regard to road safety education in schools. It should appoint a National Committee on Road Safety Education, comprising traffic experts, educationists and representatives of the general public and entrust it with the task of (a) defining the basic Road Safety Code which is to be taught to children in schools; and (b) preparing the blue print for a scheme of Road Safety Education in primary and secondary schools for adoption all over India. The scheme should be immediately implemented and become part of the educational curriculum under Social Studies (6.12.1.).

108. Road Safety education should be given to the adult road users in the garb of entertainment or through media like posters,

slogans, cinema slides and television which convey at a glance the requisite message. This should be supplemented by the use of mobile police vans, equipped with amplifiers and loud speakers, to exhort the public to observe the rules of the road. The holding of essay competitions, safety slogan and poster contests, among students as well as the general public, will arouse interest in road safety (6.12.2.).

109. Motor sports, like reliability trials and rallies, should be encouraged to promote safer driving and careful maintenance of motor vehicles (6.12.3.).

110. Road Safety Congresses, Seminars, Symposia, Study Weeks, Safety Weeks and Safety Talks should be organised to foster exchange of ideas and experience on problems of road safety and their solutions (6.12.4.).

111. Safety awards to drivers of public service vehicles and conferment of the distinction of "Driver of the Year" on drivers with outstanding records will stimulate good driving (6.12.5.).

112. Newspapers should mobilise public opinion in favour of measures for promoting road safety, by publishing pictures, slogans, feature articles and safety supplements conducive to such a cause (6.12.6.).

113. Since the present accident report form A-1 is not comprehensive for proper analysis of accidents, a revised form is suggested. This should be introduced for use uniformly throughout the country. All accidents, whether minor or major, should be directly recorded on this form and the present practice of entering some accidents in the Police daily diaries only should be discarded. Personnel should be trained to fill up the form as accurately as possible (6.13.1.).

114. The summary accident record form-4 as revised in conformity with the proposed form A-1 should be used for preparation of summaries (6.13.2.).

115. In all cities, accident investigation squads with trained men should be set up. For this purpose a city should be divided into zones, each zone being headed by an officer not lower in rank than a Deputy Superintendent of Police who should have all the accidents occurring in his particular zone reported to him (6.13.3.).

116. Fatal accidents on a sample basis should be occasionally studied by a team of experts, including a police officer, a doctor, a traffic engineer, an automobile engineer and a psychologist, to find out the cause and to make concrete suggestions for better road safety (6.13.3.).

117. There should also be a statistical cell attached to the traffic branch of the police for compilation and analysis of accident data. A traffic Research Supervisory Committee should be established to assist the work of the Statistical Cell (6.13.3.).

118. A Traffic Enforcement Division should be set up at the State level in the Police department for the investigation of accidents on rural roads and planning of enforcement measures (6.13.3.).

119. For planning and directing road safety activities on a sustained basis throughout the country, a National Road Safety Council should be constituted as a statutory body through an enactment in the Parliament on the lines approved by the Transport development Council at its meeting held on 30-4-1963, together with a few modifications as suggested by the Study Group (6.14.1.).

120. State Road Safety Councils should be created as counterparts of the National Road Safety Council for coordinating the activities of various departments as are related to road safety (6.14.2.).

121. District Road Safety Councils should be constituted to coordinate the activities of official and non-official bodies concerned with road safety in the districts (6.14.3.).

122. A Road Safety Fund of non-lapsing nature should be created for the working of the National Road Safety Council and its resources built up from various collections as stated in the draft constitution of the said Council and further supplemented by diversion of an additional 20 per cent of the Central Road Fund exclusively for its use and a contribution of 10 per cent of the insurance premia on the motor vehicles (6.14.6.).

123. Traffic Engineering Divisions should be set up in all State PWDs and Municipal Corporations with functions as detailed in the report (6.14.4.).

124. Wireless Traffic Aid Posts should be set up all over the country along the National Highways (6.15.1.).

125. Overloaded vehicles should be checked and relieved of their excess loads at regular weigh bridges located at points of entry into and exit from main highways near big cities (6.15.2.).

126. Decisions in regard to speed limits should be taken on the expert advice of traffic engineers and based upon a scientific assessment of the different factors involved. The 'prudent speeds' of vehicles should be observed and analysed in relation to the character of the road and the accident rate thereon (6.15.3.).

127. Existing speed limits should be reviewed and, after due modifications and lapse of a period of warning, they should be strictly enforced. The effect of these restrictions on the flow of traffic and the accident rate should be watched carefully and the limits modified from time to time on the basis of experience gained (6.15.3.).

128. In some areas of sufficient size, to yield reliable results, highly trained mobile police patrols should be employed in large numbers to ensure effective supervision. They should be provided with motor cycles so that they can readily thread their way through traffic. They should also be equipped with portable 'wheel weighers'. There should be special Traffic Squads in fast moving automobiles to check speed violations, hit and run cases, over-loading of vehicles and other such violations of the law (6.15.4.).

129. Traffic Wardens selected from the general public should be appointed in urban areas with a population of more than 4 lakhs and invested with some minor powers of the traffic police. They should report to the traffic authorities, violations of the rules by any driver or bus conductor or other road user, for appropriate follow-up action. Besides, they should render assistance to the victims of road accidents (6.15.5.).

130. A few ambulance vehicles, adequately staffed for first-aid, should be made available to the police, so that prompt assistance can be rendered to the victims of accidents (6.15.6.).

131. Advertising signs on the roadside should be controlled by the adoption of a code on a voluntary basis by the trade and also through legislative and administrative action (6.15.7.).

Summary of Conclusions and Recommendations of the Sub-Committee on Road Accidents in Hill Areas.

1. The practice of authorising hill routes on the basis of trial runs of over-sized vehicles under controlled conditions, should be avoided. Where such traffic has already been authorised and further regulation is considered not feasible, their improvement to suitable design standards for the operation of such vehicles should be urgently taken up (7.1.4.).

2. Since accidents of buses operating on hill roads are attended with serious loss of life, measures for the checking of their condition and for their being driven only by specially qualified drivers should be taken. Also, the overloading of such buses, under all circumstances, should be prevented (7.1.5.)

3. Audible warning of approach by sounding the horn should be given by drivers when they negotiate blind curves and corners (7.2.1.3.).

4. Severe action should be taken against persons found driving motor vehicles on hill roads without valid driving licences (7.2. 1.4.).

5. In designing curves, gradients and cross-sectional features of the road, principles of safety as enumerated under item 7.3.1. of Chapter 7 should be adhered to as far as possible (7.3.1.).

6. At the ends of long descending grades, speed breaking ramps should be provided to protect runaway vehicles (7.3.2.1.).

7. Passing zones should be provided at every 500 metres along single lane roads for the safe passing of vehicles (7.3.2.2.).

8. One-way traffic should be resorted to in all single lane sections of hill roads where movement of traffic bothways is considered unduly hazardous (7.3.2.4.).

9. Centre line markings should be adopted at all curves (7.3.2.7.).

10. Delineators and warning signs should be liberally installed along hill roads (7.3.2.6. & 8.).

11. Protective measures such as breast walls, terracing, shelters, snow fences, paving of dips, afforestation of slopes and

longitudinal drainage should all be adequately provided/arranged (7.3.3.).

12. Both normal and emergency maintenances should be more prompt and should be of a much higher standard than that for roads in the plains. In addition, mechanical equipment should be employed for their expeditious completion (7.3.4. & 5.).

13. Persons who wish to drive heavy commercial motor vehicles on hill roads should get their driving licences endorsed for driving on such roads. The licencing authority should satisfy itself about the applicant's ability and qualifications for driving on hill roads before making the endorsement (7.4.1).

14. The law relating to hours of duty should be applicable even to single vehicle owners and must be scrupulously observed (7.4.1.2.).

15. Drivers should be provided with rest rooms with toilet and recreational facilities at suitable intervals (7.4.1.3.).

16. Relief crew should be stationed at specified places to replace the bus crew on duty if the vehicle has to run more than 8 hours at a stretch (7.4.1.3.).

17. Way-side liquor shops should not be licensed. Those found driving under the influence of liquor should be punished (7.4.1.4.).

18. Only those professional drivers who undergo a recognised course of specialized training should be permitted to operate transport vehicles on these roads. They should undergo and pass periodical medical tests (7.4.1.5.).

19. Driving downhill in neutral gear must be considered an offence and action taken against the driver (7.4.1.6.).

20. Vehicles older than five years generally and, in any case, not more than seven years, should be banned on hill roads (7.4.2.1.).

21. Tests for mechanical fitness of heavy transport vehicles plying on hill roads should be rigorous. Such vehicles should be tested for their road worthiness every six months (7.4.2.1. & 2.).

22. The width of the buses using hill roads should not exceed the width of the rear axle by more than 7.5 cm. The over-hang of the body at the rear should not be more than 45 per cent of the wheel base. The rear of the body should be tapered to make the vehicle more manoeuverable (7.4.2.3.).

23. The driver's cabin should be separated from the accommo dation for passengers (7.4.2.3.)

24. The registration of a vehicle and the licence of its driver should be suspended if the vehicle is detected in an overloaded condition (7.4.2.4.).

25. The strength of the enforcement staff should be increased. They should patrol the roads regularly to detect overloading and other traffic offences (7.4.2.4.).

26. The patrolling staff should be supplied with portable enforcement aids and also motor cycles for use on duty (7.4.2.4.).

27. Heavy transport vehicles should carry chocks for use when the vehicles stop on the wayside (7.4.2.5.).

28. Reflectors should be compulsory fixtures on all vehicles including bullock carts (7.4.2.6.).

29. Lay-byes should be provided along the flanks of the road where it can be widened suitably (7.4.2.6.).

30. Breakdown towing vans fitted with cranes should be stationed at convenient points (7.4.2.6.).

31. Wireless traffic aid posts should be set up on hill roads. Telephone booths along these roads will be an added benefit. (7.5.1.).

32. Repair and servicing facilities including fuel filling stations should be available at appropriate intervals along these roads (7.5.2.).

33. Scenic look-outs should be constructed at points of extreme beauty with facilities for parking a few cars (7.5.3.).

Sd/-
(TULSIDAS JADHAV)

(HIMAT LAL V. GANDHI)*

Sd/-
(B. N. LAHIRI)

Sd/-
(INDRAKANT PATEL)

Sd/-
(DILIP K. SEN)

Sd/-
(N. S. SRINIVASAN)

Sd/-
(C. L. N. IYENGAR)

Sd/-
(K. G. SUBRAMANIAN)

NEW DELHI
29.6.1972

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*consent taken

ANNEXURE I

GOVERNMENT OF INDIA

MINISTRY OF SHIPPING & TRANSPORT

(Transport Wing)

New Delhi, the 3rd June, 1969

RESOLUTION

No. 19-T(14)/68: The incidence of road accidents in the country has been on the increase during the last few years. Several measures have been taken by Governments and non-official agencies for promoting road safety and eliminating traffic hazards. However, inspite of these measures, there is no significant improvement in the position. It has been felt that there is need to go into the whole question of road safety including collection and analysis of data and suggest practical measures for implementation. It has accordingly been decided to set up a Study Group to undertake such a study so that concrete proposals may emerge from it.

2. The composition of the Study Group will be as follows:—

(i)	Prof. K.T. Merchant, "Panch Sheel," C-Road, Marine Drive, Churchgate, Bombay.	*Chairman*
(ii)	Shri Himatlal V. Gandhi, 17, Horniman Circle, Bombay.	*Member*
(iii)	Shri B.N. Lahari, 3, Ponnappa Road, Allahabad.	*Member*
(iv)	Shri Indrakant Patel, Tractor House, Vishwamitri, Baroda.	*Member*
(v)	Shri D.K. Sen, Akash Deep, 5, Lower Rawdon Street, Calcutta.	*Member*

Shri K.G. Subramanian, Secretary, Western India Automobile Association, Bombay, will work as Secretary of the Group in an honorary capacity.

3. The terms of reference of the Study Group will be as follows:

(a) to enquire into the incidence of road accidents both in urban areas and on Highways in India, ascertain the cause of such accidents and suggest a suitable organisational set-up for collection and analysis of data/statisticals relating to such road accidents.

(b) to suggest measures for education of road users in road safety and better enforcement of traffic laws and regulations and recommend imporvements in roads as may be necessary, to ensure the maximum possible safety on roads ; and

(c) to suggest such other measures as may be germane to (a) and (b) above.

4. The headquarters of the Study Group will be at Bombay but it will be free to visit such places as it may consider necessary in connection with

its work. The Central Government hope that the State Governments, local bodies and others concerned will afford the Group all assistance it may require and furnish any information which it may call for.

5. The Study Group will endeavour to submit its report within three months from the date of its first meeting.

ORDER

Ordered that copies of the resolution be communicated to all concerned and also that it be published in the Gazette of India for general information.

Sd/-
K. NARAYANAN,
Joint Secretary to the Government of India.

ANNEXURE 2

GOVERNMENT OF INDIA

MINISTRY OF SHIPPING & TRANSPORT

(Transport Wing)

STUDY GROUP ON ROAD SAFETY

QUESTIONNAIRE

1. (a) What according to you is the total number of motor vehicles on the road as on 31st March, each year from 1964 to 1968 with particular reference to your State classified into the following categories:—

    - Passenger buses
    - Motor Cabs
    - Lorries or Trucks
    - Delivery vans
    - Private motor cars
    - Three wheelers like auto-rickshaws and bicycle rickshaws
    - Motor cycles and scooters
    - Other motor vehicles and Push bicycles.

    (b) How many of these vehicles are in operation today, city wise/district wise in your State?

    (c) In addition to motor vehicles and bicycle what are the other types of road vehicles that you have in your State? Please give statistics, vehicle wise and city/distanct wise, for the last 5 years.

    (d) Give a list of the National and State Highways in your State. What type of surface do they have and what is their width?

2. What according to you is the incidence of accidents in your City/State? How are accidents classified in your State?

3. Please furnish statistics of accidents involving different types of vehicles and pedestrians during the past 10 years.

4. What is the procedure the authorities follow for the collection of accident information and the compilation of statistics? Is there a separate machinery for this type of work and are you satisfied with its functioning? What improvements, if any, would you suggest?

5. Describe the accident reporting methods followed in your State. Are they standardised? How do they compare with those in other States?

6. What are the main urban areas in your State? Can you throw light on road accidents in those places? Name the authorities concerned who are in charge of traffic control and roads in such areas. (Urban areas are those with a population of over a lakh).

7. Do you have a separate Traffic Control Branch in your Police administration? Do you think it is necessary and useful?

8 Which is the authority in control of traffic on your Highways? What sort of control does it exercise and what is the machinery at its disposal for recording, collecting and maintaining statistics of accidents on the Highways?

9. Please give statistics of accidents, vehicle wise, for the past 10 years in cities and towns in your State and for the State as a whole.

10. What is your analysis of the causes of road accidents? What are the steps taken in your State to bring down the number of accidents? How far are they effective?

11. Is traffic safety a big or serious problem in your area? Are local authorities and the public aware and cnoncerned about it? Are any serious efforts being made to tackle this problem? which organised groups are doing much for it— Police, Lions Club, Junior Chambers, Women's Association, Boy Scouts, Teachers, Parent-Teacher Association, Rotary Club?

12. What sort of an organisational set-up would you suggest for the collection and analysis of data-statistics relating to road accidents?

13. Who or which group of road users, do you think are mainly responsible for traffic safety problems? Why do you think so? Have you any statistics to prove your conclusion?

14. Describe the measures in operation for the education of road users. How far are they effective? What other steps would you suggest for inculcating the correct road sense among the road users?

15. It is stated that road safety should form a part of school education. Has this been accepted as a State Policy? If not, what action would you suggest for its acceptance and implementation?

16. Describe the set-up for the enforcement of traffic laws in your State? Do you think there is scope for improvement in enforcement methods and if so in what respects?

17. How far is it true that enforcement traffic regulations suffer from want of adequate trained personnel and modern equipments of traffic and enforcement aids?

18. Are the traffic laws adequate enough to fulfil their objectives? If not, in what way are they deficient? What are your suggestions to improve them so as to meet the present day needs?

19. Do you think traffic control authorities in your area have inadequate powers? What additional powers e.g. power to suspend or cancel driving licences would enable the enforcement of traffic safety?

20. Do you think Mobile Courts, to dispense justice on the spot will help to solve traffic safety problems?

21. To what extent Municipal and City Engineers, Road Contractors, Water and Telephone Line Repairers etc. can be said to be responsible for disorganising traffic and endangering safety? What steps would you suggest to restrict them effectively from doing this?

22. What is the relationship between road conditions and accidents? What improvements would you recommend to ensure maximum possible safety on roads?

23. Please describe the Hihgway Safety Programme of your State and the facilities it provides for systematic and scientific analysis of accidents.

24. How does your State provide for qualified instructors for the training of drivers? Do you have any arrangements for refresher courses for the retraining of adult drivers?

25. What facilities do you have for training efficient traffic control personnel? What additional facilities would you desire to promote road safety in your area?

26. How do you register and license your driver training establishments? Do you think the present arrangements are adequate? What improvements, if any, would you advocate?

27. Would you recommend insurance concessions for drivers who complete approved driver training course?

28. What traffic laws, authority and facilities do you have for stopping pedestraians from jaywalking and committing other traffic offences? What measures would you suggest in this regard?

29. State if there is any planned pedestrian programme before your Government based on uniform legislation for regulation and control of pedestrian movement.

30. How often are motor vehicles in your State tested for mechanical fitness? What is the nature of the tests? Mention the types of vehicles tested.

31. What national standard would you advocate for school buses and the licensing of their drivers? What are the existing traffic laws relating to school transportation?

32. What in your opinion is the relationship between air pollution and accidents? What is the extent of this problem in your State?

33. To what extent cattle nuisance on the roads can be said to be responsible for accidents?

34. What part does street lighting play in promoting road safety?

35. What improvements in vehicle condition and design would you suggest which would enhance safety and reduce risk of serious accidents?

36. How far is it true that unprotected railway level crossings are responsible for a good number of motor vehicle accidents? Please give statistics of such accidents for the past 10 years stating the measures that are being taken to ensure safety of road traffic at such crossings.

37. Is the general public co-operative or obstructive in your efforts to discipline traffic? What type of assistance do you wish from them? What steps do you suggest?

38. Any other general remarks on this subject.

ANNEXURE 3

Government of India

MINISTRY OF SHIPPING & TRANSPORT

(Transport Wing)

STUDY GROUP ON ROAD SAFETY

General Questionnaire

1. What are your views on the incidence of road accidents with particular reference to your State? How do such accidents in urban areas compare with those on the Highways?
2. If you were to be placed in charge of traffic in a busy city, what concrete steps would you take to make traffic better and safer?
3. What is your opinion about the existing machinery for the investigation and prevention of accidents? What improvements would you suggest?
4. What in your opinion are the causes of Road accidents? What sort of an organisational set-up would you suggest for collection and analysis of data/statistics relating to such accidents.
5. Which preventive steps do you consider necessary to bring down the number of road accidents and promote safety?
6. In what ways do you think the public can help the authorities in reducing the number of road accidents? What part in your view should public leaders, newspapers, radio, films and other mass communication media play in improving safety? Give concrete suggestions.
7. In view of the part which road safety plays in bringing down insurance claims, what contribution would you suggest the Insurance Companies should make for promoting road safety?
8. What kind of measures according to you are necessary—
   - (a) for the education of road users in road safety,
   - (b) for better enforcement of traffic laws and regulations,
   - (c) for improvements in road conditions to ensure the maximum possible safety on roads, and
   - (d) for improving the standard of driving and promoting better road sense on the part of the different road users?
9. Which from the following, do you think, will contribute more towards promoting road safety?
   - (a) Mass Traffic Education

  - (b) Better Driver Training
  - (c) Stricter Law Enforcement
  - (d) Disciplining of Pedestrians
  - (e) Better roads, wider roads, better road illumination at night
  - (f) Wider footpaths
  - (g) Increasing/Reducing Speed limits.

10. What part does the condition of the vehicle play in road accidents? Describe the most common mechanical faults which contribute to accidents. How far are the indigenously manufactured motor vehicles free of such faults.

11. Are you of the opinion that
    - (a) Slow moving vehicles like bicycles

      and

    - (b) 2 wheeler motor vehicles like motor cycles, motor scooters etc. are responsible for a good many accidents? If so, how would you control them to ensure fewer accidents?

12. Do you think more severe punishment should be given to those who cause accidents? Will this help to reduce accidents?

13. What changes in traffic offence punishments do you suggest? Higher fines? Detention or jail? Suspension and cancellation of licence?

14. Do you think many accidents are caused because road users do not know traffic rules? Should authorities give more publicity to traffic rules before becoming stricter in law enforcement?

15. Have you been involved in an accident? If so, please give full details with your suggestions for preventing such accidents.

16. If you have any personal knowledge of any accident, please give full details with you comments.

17. Any other observations for promoting road safety and preventing road accidents.

ANNEXURE 4

List of the replies to the General Questionnaire received from the *Authorities* from the different States in India.

Maharashtra

(1) Inspector General of Police, Maharashtra State.
(2) Commissioner of Police, Poona.
(3) Commissioner of Police, Nagpur.
(4) The Director of Transport, M.S., Bombay.

Delhi

(1) Inspector General of Police, Delhi.
(2) Director of Transport, Delhi.
(3) Deputy Commissioner, Delhi Administration.

Rajasthan

(1) Under Secretary to the Government of Rajasthan, Jaipur.
(2) Addl. Supdt. of Police, Jaipur.
(3) Regional Transport Officer, Udaipur.
(4) Public Works Department, Rajasthan.
(5) Supdt. of Police, Udaipur.
(6) The Home Department, Rajasthan.

Jammu & Kashmir

Inspector General of Police, Jammu & Kashmir.

Himachal Pradesh

Suptd. of Police, Railways & Transport Dept., Himachal Pradesh.

Gujarat

Commissioner of Police, Ahmedabad City.

Orissa

Inspector of Motor Vehicles, Vigilance, Cuttack, Orissa.

Assam

Asst. Inspector General of Police, (Traffic), Govt. of Assam.

Uttar Pradesh

(1) The Chief Engineer, (Border), PWD, Lucknow (U.P.).
(2) Deputy Secretary (B) Department, Lucknow.

Madhya Pradesh

(1) Chief Secretary Home (Police) Department, M.P. Bhopal.
(2) Chief Engineer, M.P. (Public Works Department).

Madras

(1) Inspector General of Police, Madras.
(2) Deputy Secretary to the Govt. of Madras (Home Department).
(3) Dy. Transport Commissioner, Madras.
(4) Chief Engineer (Highways and Rural Works).

Haryana

(1) State Transport Controller, Haryana, Chandigarh.

Mysore

(1) Under Secretary to the Govt. of Mysore, Home Department.
(2) Chief Engineer (B & C) Department.

Kerala

(1) Supdt. of Police, Ernakulam.

Andhra Pradesh

(1) Transport Commissioner, Hyderabad.
(2) Inspector General of Police, Andhra Pradesh.

West Bengal

(1) Inspector General of Police, Calcutta.
(2) Deputy Commissioner of Police (Traffic), Calcutta.
(3) Transport Department, Calcutta.
(4) Assistant Superintendent of Police, Asansol.

ANNEXURE 5

Answers to the Questionnaire and other Memorandum received by the Study Group on Road Safety from Non-officials, Automobile Associations, Transport Unions, Industries, Educational Institutions and others.

(a) Transport Operators' Association, Drivers, Tourist Syndicate etc.

(1) Major Chandan Singh, The Commercial Transport Operators' Association, Chandigarh.

(2) Shri Narindar Singh Kharbander, Managing Director, Chandigarh Tourist Syndicate Pvt. Ltd., Chandigarh.

(3) Shri M.K. Bhargava, Gen. Secretary, Uttar Pradesh Operators Union, Lucknow.

(4) Shri M.V. Chikkanna, S.R.M.S. Tourist Service, Bangalore and Shri Ranganath Motor & Lorry Service, Bangalore.

(5) The Manager, S.R. Motor Service, Varkala (Kerala State).

(6) Shri T.K. Sheshadri, Chairman, Motor Vehicles & Allied Industries Association, Bihar.

(7) Bihar Transport Users' Association, Bihar.

(8) Kashmir Motor Drivers' Association, Srinagar.

(9) The General Secretary, The Krishna District Lorry Association, Vijaywada (A.P.).

(10) The Garhwal Motor Owners' Union Ltd., Kotdwara (Garhwal).

(11) The Shopkeepers of Gole Market, Rishikesh.

(12) The Chief Operating Manager, Calcutta Tramways.

(13) The General Secretary, Taxi Drivers' Union Calcutta.

(14) The Honorary Secretary, Calcutta Taxi Association.

(b) Automobile Association, Safety Councils, Indian Institute of Road Transport and State Transport Undertakings.

(1) Mr. Taher D. Tyebjee, President, W.I.A.A., Bombay.

(2) Mr. P.M. Chudasama, Branch Secretary, W.I.A.A., Ahmedabad Office.

(3) Shri M.S. Bhaskaran Nair, Union Automobiles Ernakulam, Cochin-11. Secretary, A.A. Southern India, Cochin, Secretary, National Safety Council, Kerala.

(4) Shri C.D. Jefferies, Ex-Assistant to the General Manager, B.E.S.T., Bombay.

(5) Shri G.J. Krishna, Hon. Secretary, Indian Institute of Road Transport, Madras Branch.

(6) Lt. Col. M. Osman, Secretary. A.A.S.I., Madras.

(7) Shri N. Balkrishna, Hon. Secretary, Indian Institute of Road Transport and the Safety First Association of India, Bombay.

(8) Shri S.H. Gaikwad, President, Transport Committee, Sholapur Transport Service, Sholapur Municipal Corporation.

(9) Transport Manager, Ahmedabad Municipal Transport Service, Ahmedabad Municipal Corporation.

(c) **Educational Institutions and others.**

(1) Mr. Pannalal Mahajan, President, Nagarpalika, Amritsar.

(2) The Head Master, St. Joseph's High School, Trivandrum.

(3) Mr. J. Bhaskarao, Editor, 'Ravana Samachar', Vijaywada-2.

(4) Mr. P.S. Rajagopal Raju, Officer on Special Duty, APS Agro Industries Corpn. Ltd., Hyderabad-4.

(5) Shri Gungaram Joshi, J.P. Bombay.

(6) Prof. B. Ramamurthi, Madras Medical College.

(7) Mr. B. Abdul Gundir, Hon. Secretary, National Chamber of Commerce, Madras.

(8) The Manager, M/s. Kamal & Co., Jaipur.

(9) The Secretary, Delhi General Merchants Association, Delhi.

(10) Mr. J.D. Gulshan, Prop : J.D. Gulshan & Co., Delhi.

(11) Mr. V.S. Banshetti, Mayor, Sholapur Municipal Corporation, Sholapur.

(12) Citizens of Mohal Taluka, Sholapur Distt. (Maharashtra State).

(13) The Secretary, Gujarat Chamber of Commerce & Industry, Ahmedabad.

(14) M/s. New India Precision Instrument on "Electronic Dipper—As Safety Device."

(15) The Chairman, Indian Institute of Scientific Studies for the Prevention of Alcoholism.

(16) The All India Prohibition Council, New Delhi, Booklet on "Alcohol and Road Safety".

(17) Shri G.V. Venkatesulu, B.E. (Hons.) Superintending Engineer, (Bridges), Ministry of Shipping & Transport, (Roads Wing), New Delhi on "Provide Footpaths Invariably in Long Bridges".

(18) The Under Secretary to the Government of Gujarat, Home Department, on "Removal of Vehicles involved immediately after the occurrence".

(19) The Upper India Trading Co. Ltd., Bombay on "Carex Reflex Reflectors".

(20) The President, W.I.A.A., Bombay, on : "Compulsory Fitment of Safety Belts".

(21) Suggestions to make the Draft Report received from the Deputy Secretary to the Government of India, Ministry of Shipping & Transport (Transport Wing), New Delhi.

(22) Shri R.P. Sikka, Superintending Engineer (Standards). Ministry of Shipping & Transport (Road Wing), New Delhi.

(23) Shri T.K. Mitra, Hon. General Secretary, Federation of Bus Syndicate, Calcutta-13.

(24) Shri V.K. Raheja, Vijay Instrumental Work, Sales Office, New Delhi, on "The Driver Testing Units I and II".

(25) Shri P.K. Banerjee, Calcutta, reporting his experiences of the "World Safety Conference in Japan".

(26) M/s. Haldeyn Glass Works Private Ltd., a note on "Glass Beads"

(27) Shri G.P. Nautiyal, Journalist, Nandprayag, a note on "Mass denundation of frests in chamoli Border hills".

ANNEXURE 6

Date, place and the names of parties present at the meetings held with the officials and non-officials

Sr. No.	Date	State	Venue & Date	Parties interviewed
1	14-3-70	Uttar Pradesh	Lucknow (Council House) 14-3-70 to 15-3-70	(a) **State Govt. Officials** Kum. Kusum Lata Mittal, Special Secretary, P.W.D. & Transport Dept., U.P. Shri R. Bhardwaj, Transport Commissioner, U.P. Shri H.G. Varma, Chief Engineer, P.W.D., U.P. Shri D. Dubey, Dy. Secretary, Transport Department, U.P. Shri B. Mukherjee, Dy. Transport Commissioner, U.P. Shri G.B. Lal, Dy. Transport Commissioner, U.P. Shri A.N. Kaul, S.S.P., Lucknow Shri Chaturvedi, S.S.P., Kanpur. Chief Engineer, L.S.G.D. Chief Town & Country Planner. Dy. Chief Engineer, P.W.D. Director, Economics, Intelligence & Statistics. Shri Gupta, Municipal Engineer, Nagar/Mahapalika, Lucknow. Shri Mitra, Municipal Engineer, Nagar/Mahapalika, Kanpur. (b) **Non-officials.** Shri Udai Nath, M.L.A. Lucknow. Shri B.C. Misra, President, T axi Union. Shri A.N. Misra, General Secretary, Truck Owners Association Shri Mohamed Nasir, President, Auto-rickshaw Union.

Sr. No.	Date	State	Venue & Date	Parties interviewed
				Shri E.J. Fonseca, Kumaon Motor Operators Union, Kathgodam.
				Shri M.K. Bhargava, General Secretary, U.P. Motor Operators Union.
2	24-4-70 to 26-4-70	Punjab	Chandigarh 24-4-70 to 25-4-70	(a) **State Govt. Officials.** Transport Secretaries of Punjab, Haryana & Chandigarh Union Territory.
				Transport Commissioner, Punjab State.
				Director, State Transport, Punjab & Haryana.
				General Manager, Chandigarh Union Territory.
				A.I.G. (Traffic), Punjab.
				S.P. (Traffic), Haryana.
				S.S.P. of Chandigarh Union Territory.
				Secretary of Transport, Punjab.
				Chief Engineer, Capital Project, Chandigarh.
				Director of Town & Country Planning, Punjab-Haryana.
				Chief Engineer, Chandigarh Union Territory.
				Home Secretary, U.T.
				Joint Provisional Transport Controller, Haryana.
				S.P. (Traffic), Haryana.
				D.S.P., Chandigarh Union Territory.
				Shri H. Singh, A.I. Co/Traffic.
				Shri Manoharlal, Secretary, R.T.A. Jullunder.
				Shri N.S. Channa, Secretary, R.T.A., Patiala.
				Shri V.S. Sodhi, Distt. Transport Officer, Ludhiana.
				Shri Subash Jain, Town Planner.
				Miss Sethi, Dist. Election Officer, Chandigarh Union Territory.

Sr. No.	Date	State	Venue & Date	Parties interviewed
				(b) **Non-officials.**
				Maj. Chandan Singh, Representative, Commercial Transport Union.
				Representative, Chandigarh Tourist Syndicate.
				Shri Pritam Singh Khatra, Director, The Patiala Bus Service.
				Sardar Iqbal Singh, Principal, Paul Motor Driving College, Chandigarh.
				Shri N.S. Kharbanda, Representative Chandigarh Tourist Syndicate Pvt. Ltd.
				Shri Satya Dev, Representative, Punjab University.
				Sardar Gurubaksh Singh, President, Scooter-rickshaw Union.
				Sardar Majit Singh, Scooter driver Union.
				Shri B.K. Saini, President, Punjab Motor Union.
				Shri K.K. Khanna, General Secretary, Amritsar-Pathankot Transport Operators Union.
				Shri Vishnu Bhaghwan, Amritsar Frontier Transport Co-op. Society.
				Shri Harbachan Singh, Secretary, The Amritsar-Moga-Ferozepur Transport Operators Association.
				Shri Charan Singh, Managing Director, New Himalaya Transport Pvt. Ltd., Batala.
				Shri Amar Singh, Director Incharge, New Middle Bhadra Transport Co. Ltd., Batala.
				Shri Amar Singh Gill, Secretary Amritsar Frontier Transport Co-op. Society Ltd., Amritsar.
				Shri K. Singh, The New United Transport Association P. Ltd., Amritsar.

Sr. No.	Date	State	Venue and date	Parties interviewed
				Major R. Singh, J.P., Punjab. Shri Moti Singh, Rohtak District, Transport Co.
				Shri Saligram, Punjab T.P.T. Co-op. Society Ltd., Amritsar.
				Shri Swaran Singh, G.M., Punjab Roadways.
3	6-6-70 to 9-6-70	Maharashtra	Bombay 6-6-70	(a) **State Govt. Officials.** Shri Jasjit Singh, Addl. Secretary (Home) Department.
				Shri A.G. Rajadhyaksha, I.G.P., M.S.
				Shri S.G. Pradhan, Commissioner of Police, Bombay.
				Shri F.C. Scott, A.G. & S.P., S.T.B.
				Shri N.S. Karkarey, Dy. Commissioner of Police, Bombay Traffic.
				Shri P.S. Navalker, Chairman, B.E.S.T., Standing Committee.
				Dr. M.N. Desai, Municipal Commissioner,
				Shri G.M. Lalwani, General Manager, B.E.S.T.
				Shri V.D. Desai, City Engineer, T & C., B.M.C.
				Shri R.G. Saradya, Chairman, M.S.R.T.C.
				Shri P.G. Salvi, General Manager, M.S.R.T.C.
				Shri R.G. Salvi, Secy. to the Govt. of Maharashtra, Education Dept.
				Shri S.M. Nabar, Director of Police, Wireless, M.S.
				Shri K.G. Kale, Buildings & Communication Department.
				Shri M.N. Andhare, Buildings & Communication Department.
				Shri P.V. Sathe, Supdt. Engineer, Road Development Design Circle.
				Shri S.M. Karaka, R.T.O., Bombay.

Sl. No.	Date	State	Venue & Date	Parties interviewed
				Shri M. Subramanian, Director of Transport, M.S. Bombay.
				Shri L.J. Sajnani, Regional Manager, I.T.I.
				Shri J.V. Kamath, Deputy Director, Town Planning.
				Shri J.G. Keskar, Deputy Director, Town Planning.
				Shri B.N. Bhagat, Chief Ex. Officer, Maharashtra Development Corporation.
				Shri M.D. Kale, Building & Communication Department.
				(*b*) *Non-officials.*
				Shri V.L. More, M.L.A., Bombay.
				Shri M.N. Gogate, M.L.A.
				Dr. Samant, M.L.A., Nagpur.
				Shri Mainudin Harris, M.L.C.
				Shri Mehta.
				Shri J.G. Patkar, M.L.A. Representative of Bombay Goods Transport Association.
				Shri Bapat.
				Shri R.V. Kulkarni.
				Shri K.L. Karkar.
				Shri Baji, Secretary, Taxi Drivers Association.
				Shri Anna Patil, Mathari Kamgar Union.
				Shri Jamsandekar.
				Shri Mohinder Singh, Representatives of Taxi Drivers.
				Shri Kumaran, Dy. General Manager, IOC.
				Shri D.S. Dhandha, Esso Eastern Inc.
				Shri W.T., Rego, Esso Eastern Inc.
				Shri S. Prabhakar, Everest Films.
				Shri S.B. Sakhalkar, Secretary, M.E.O. Council.

Sl. No.	Date	State	Venue & Date	Parties interviewed
				Shri M.R. Desai, Dy. Secretary, Indian Merchant Chambers.
				Shri N. Balkrishna, General Secretary, I.I.R.T. & Safety First Association of India.
				Mr. A.D. Dingray, I.R. & T.D.A.
				Shri Charles D'Silva, Caltex (I) Ltd.
				Shri Taher D. Tyebji, President, W.I.A.A.
				Shri S. Namazie, Regional Manager, Western India Caltex Ltd.
				Shri Tej Ram, Burmah-Shell, Bombay.
				Shri Rashiklal C. Shah & Shri Muralides Jalan Passengers Traffic Relief Association, Bombay.
				Dr. C.B. Mirje, Chairman, Community Service, Rotary Club of India (East), Bombay.
				Shri L.R. Reddy, CEAT Tyres of India Ltd.
				Mrs. N.S. Dahanukar, Chairman, Welfare Organisation of Road Safety Patrol Association.
				Shri C.V.K. Murthy Rao, A.I.A.M. Bombay.
4.	3-7-70 to 6-7-70	Bihar	Patna & Ranchi 3-7-70 to 5-7-70	(a) *State Govt. Officials.* Chief Secretary to the Govt. of Bihar.
				Shri Ghosh, State Transport Commissioner, Bihar.
				Addl. I.G. of Police, Bihar.
				Chief Engineer, P.W.D. Town Planner, Bihar.
				Representatives, P.W.D.
				Shri Verma, Representative, Patna University.
				Regional Director of Education, Patna.
				Shri B. Prasad, Chief of Operations, Bihar, Patna Corporation.
				Shri S.P. Sinha, Dy. Transport Commissioner.

Sl. No.	Date	State	Venue & Date	Parties interviewed
				Shri R.N. Sinha, Executive Engg., P.W.D., Bihar. Shri S.L. Sanyal, Addl. Transport Commissioner. S.P. Ranchi, D.I.G., Ranchi. S. P. Jamshedpur. Shri A.B.L. Verma, S.D.E.O., Sardar, Ranchi. Shri R.N. Sinha, Executive Engineer, P.W.D. Shri S.K. Verma, Chief Executive Officer, Ranchi Improvement Trust. Shri Dayal Kumar, Motor Vehicle Inspector, Ranchi. Shri M.S. Sinha, Inspector Ranchi, Shri B.N. Sahay, Supdt. Engineer P.W.D. Highway Planning Cell Patna. (*b*) *Non-officials* Shri C. Turu, Dist. Public Relation Officer, Ranchi. Shri R.N. Jha, Staff Correspondent, "The Search Light", Patna. Shri P.C. Chatterjee. Representatives of Patna University. Secretary, Chamber of Commerce, Bihar. Chairman, Ranchi Municipality. Principal, Ranchi College Ranchi Timber Merchants' Association. Chief Executive Officer, Improvement Trust, Ranchi.
5.	7-8-70 to 10-8-70	Tamil Nadu	Madras City 7-8-70 to 8-8-70	(*a*) *State Govt. Officials.* Mr. P. Kuppuswami, Commissioner of Police. Shri B.R. Guruswami, Asst. Secretary, S.T.A. Shri K. Sounderajan, R.T.O. Madras-17. Shri N. Dakshinamurthy Dy, Transport Commissioner. Director of Archives.

Sl. No.	Date	State	Venue & Date	Parties interviewed
				Shri R. Thillainayagam, Director Highway Research Station, Madras.
				Shri G. Ayyaswami, Divisional Engg., Traffic Engineering Cell, Madras-25.
				Shri N. Sivaesan, Joint Director, Tamil Nadu State Transport.
				Shri B. Rajagopal, Dy. Director-(Spl.) Metropolitan Transportation Study, Director of Town Planning.
				Shri G.M. Andavan, Divl. Engr. Metropolitan Transportation Div.
				Shri T.E. Kannan, Asst. Engr., (Traffic).
				Shri G.P. Dorai, Asstt. Commissioner of Police (T).
				Shri E.P. Kesavakutty Nair, Asstt. Commissioner of Police, Traffic.
				Shri S. Govind Swaminadan, Advocate General & Member of Tamil Nadu Police Commissioner.
				Shri A. Murugesan, Dy. Commissioner Police (Traffic & Licencing).
				Shri B. Sundaram, Dy. Commissioner (Administration).
				Shri P.V. Ramamurthi, Asstt. Secretary, Home Department.
				Shri Dakshinomurthy, Dy. Transport Commissioner.
				Shri J. Shanmuga Sundaram, Asstt. Engineer.
				Shri B.R. Guruswami, Asstt. Secretary, S.T.A.
				Shri K. Soundarajan, R.T.O., Madras-17.
				Shri E.P. Kesavan Kutty Nair, Asstt. Commissioner of Police, (Traffic).

Sl. No	Date	State	Venue & Date	Parties interviewed
				Shri G.P. Dorai, Asstt. Commissioner of Police (Transport.)
				(*b*) *Non-Officials*
				Shri A. Dhanapal, Secretary, Madras City Lorry Owner's Association, Madras-1.
				Shri K. Loganathan, Tamil Nadu Bus Owners Association.
				Shri G. Rangaswami, Vice President, Tamil Nadu Lorry Owners Federation.
				Shri S.C.B. Gopal, General Sec-Secretary, Tamil Nadu Lorry Owners Federation.
				Shri K. Arivazhagan, M.L.C.
				Shri K.K. Nambiar, Cement Service Bureau, Madras.
				Shri F.P. Antia, Indian Cements Ltd., Madras-2.
				Shri M.A. Rawoof Khan, Representative, National Chamber of Commerce.
				Shri S.V.N. Row, Chairman, A.A.S.I.
				Shri G.S. Krishna, Dunlop India Ltd., Madras.
				Shri K.A.V. Eswaran, S.R.V.S. Ltd., (Madras Chamber of Commerce).
				Shri S.V. Mulay, Service Engg., Madras Rubber Factory Ltd., Madras.
				Shri V. Srinivasamurthy, on behalf of S. Narasimhan, Headmaster, N.C.M. School.
				Shri C. Rajagopalan, Asstt. Editor, 'The Motor', Madras-2.
				Shri S. Hariharan, Representative, State Transport Advisory Committee.
				Shri Yegnyaraman, Managing Partner, Electrical & Radio Laboratory Madras-15.
				Shri U.C. Jadhav, M.L.C.

Sl. No.	Date	State	Venue & Date	Parties interviewed
				Shri G.K. Raman, Representative, Motor Vehicles & Allied Merchants Association.
				Shri T.K. Seshadri, Chairman, Motor Vehicles & Allied Merchants Association.
				Shri K.R. Ananda Raj, Secretary, Motor Vehicles & Allied Industries Association.
				Shri R.R. Rao, Secretary, Indian Roads & Transport Dev. Association, Madras-1.
				Shri Raja Mohamed, Reporter, 'Malai Murasu'.
				Reporter, "Swadashimitharan".
				Shri Regiwald, Reporter, "United News of India".
				Shri K. Ramamurthi, "Mobile".
				Shri Rao, P.T.I.
				Shri K.P. Nair, Indian Express.
				Shri V.A. Thomas,
				Shri S. Rangarajan, Asstt. Editor, "Motorindia".
				Shri K. Venkataraman, Editor, "Motor".
				Shri S. Vishwanathan, Editor, "Mobile" Industrial Economic.
				Shri S. Ganapati, "The Mail".
				Shri S. Visvalingam, "Murasoli".
6.	18-9-70 to 21-9-70	Jammu & Kashmir	Srinagar 18-9-70 to 19-9-70	(*a*) *State Govt. Officials* Director of Transport. Transport Commissioner. R.T.O., Srinagar.
				Dy. Transport Commissioner.
				Dy. Supdt. of Police.
				Administration, Srinagar Municipality Asst. Architect.
				Under Secretary to Works Dept. P.A. to Chief Engineer (R&B) Jammu.
				Joint Director, Town Planning. Supdting. Engineer, Development Authority.

Sr. No.	Date	State	Venue & Date	Parties interviewed
				D.I.G., Kashmir.
				I.G.P., Jammu & Kashmir, Home Secretary.
				A.C.E. Beacon, H.Q.
				A.I.G. (Traffic).
				S.P. Traffic Kashmir Sang, Srinagar.
				(*b*) *Non-official*
				I/C Jammu, Srinagar, Truck Union.
				Secretary, Kashmir Motor Drivers Association.
				M.L.As.
				Secretary, Baramolla Bus (Western Area).
				Representative of Joint Allotment Committee J & K.
				(*a*) *State Govt. Officials.*
7.	21-10-70 to 23-10-70	Mysore	Bangalore 21-10-70	Dy. Transport Commissioner.
				I/C Director of Town Planning
				Transport Commissioner.
				Deputy Commissioner of Police (Traffic) Bangalore.
				Commissioner of Police, Bangalore.
				Statistician, P.W.D.
				Transportation Supdt., M.S.R.T.C., Central Office, Bangalore.
				Town Planning Officer.
				I/C Senior R.T.O., Bangalore.
				Under Secretary to the Govt. of Mysore (Home Department) & Transport Department.
				Dy. Development Commissioner, D.H.P.C. Department.
				Principal, Police Training School.
				Deputy Secretary to the Home Deptt. Executive Engineer.
				(*b*) *Non-officials*
				The President, A.A.S.I.

Sl. No.	Date	State	Venue & Date	Parties interviewed
				M.S.R.T.C. Representatives.
				Shri C.M. Reddy, President, Mysore Chamber of Commerec.
				Auto-rickshaw Drivers.
				Taxi Drivers.
				Headmaster, Hardwicks High School, Mysore.
				(*a*) *State Govt. Officials*
8.	24-10-70 to 26-10-70	Kerala	Trivandrum 24-10-70	Shri P.V. Joseph, Corporation Engineer.
				Shri Gopinatha Pillai, Supdt. of Police, Ernakulam City.
				Shri Simon T. Manjooran, Dy. Transport Commissioner.
				Shri N. Gopalakrishnan Nair, Dy. Supdt. of Police, Ernakulam City.
				Shri Prem Kumar, Assistant Collector.
				Shri K.A. Mathew, R.T.O., Kottayam.
				Shri T.K.C. Vaduthala, District Industries Officer, Ernakulam.
				Shri Unnikrishnan Nair, Assistant Transport Officer.
				Shri K.G. Kaimal, T.R.O.
				Shri T. Chacko, Executive Engineer, (Buildings & Roads).
				Shri T.G. Nedungadi, Dy. Collector, Election.
				Shri V. Sundararaja Iyer, Personal Assistant (R.R.)
				Shri T.G. Joshi, Dy. Supdt. of Police, P.A. to Supdt. of Police (Rural).
				Shri T.P. Govindan Nair, Secretary, State Transport Authority.
				Shri P.N. Gopala Panicker, A.T.O. (K.S.R.T.C. Alwaye).
				(*b*) *Non-officials*
				Automobile, Secretary, A.A.S.I., Ernakulam.

Sl. No.	Date	State	Venue & Date	Parties interviewed
				Shri Anthony Vachaperambil, Convener Citizens Forum, Ernakulam.
				Shri Shivaramakrishna Iyre, Principal Maharaja's College, Ernakulam.
				Shri M.S. Bhaskaran Nair. K.S.T.Workers Union,(I.N.T.U.C.)
				Shri P.P.M. Ibrahim Khan, C.I.C., Cochin.
				Shri K.R. Gopalakrishnan Nair, President K.S.T. Workers Union, (I.N.T.U.C.).
				Shri John Kankakkadan, Convenor Bus, Passengers Action Council, Kumbalanghy.
				Shri N.K. Thankappan, Secretary, Passengers Association, Kumbalanghy.
				Shri T.K. Sreedharan, Secretary, Auto Rickshaw Driver's Union.
				Shri A. Balasubramanian, Advocate, President, Ernakulam Taxi Driver's Union.
				Shri K.A. Sevashan, Advocate.
				Shri K.J. Chakappan, Bus Passenger's Association, Mukkunnur.
				Shri P.A. Abraham, Ernakulam District Private Motor Transport Owner's Association.
				Shri K.L. Kumaran, Secretary, Private Motor Transport Owner's Assocn.
				(*a*) *State Govt. Officials*
9.	28-11-70 to 30-11-70	Delhi	Delhi (Hazari Baug)	Shri G.K. Arora, Dy. Commissioner, Delhi.
				Shri M.L. Bahnot, S.P. (Traffic).
				Shri S.C. Pandey, Director of Transport.
				Shri Rajendra Singh, G.M., D.T.U.

Sl. No.	Date	State	Venue & Date	Parties Interviewed
				Shri J.R. Anand, Asst. General Manager, (Traffic), D.T.U.
				Shri H.N. Fotedar, Jt. Director (Traffic).
				(*b*) *Non-officials*
				Shri M.P. Gupta, General Secretary, Delhi General Merchant Association.
				Prof. Lalit P. Agarwal, A.I. Medical Centre, Delhi.
				Shri H.R. Longani, Self Employed Engr.
				Shri R.C. Dennis, Esso Oil Co.
				Shri R. Bhandari, JMA Industrial (P) Ltd.
				Shri Vijay Kumar Sood, From M/s. Vijay Motor Training School.
				Shri Ashok Sood, Gold Spot, (Soft Drinking Industry).
				Shri Bhardas.
				Shri J.D. Gulsham, Insurance Surveyor of Loss Association.
				Shri Kissan, Councillor, Delhi Transport Committee and Municipal Council.
				Shri Lalchand Bedhi.
				Shri Vijay Pall Singh, Delhi Metropolitan Council.
				President Health Council, M.C. President, D.T.U.
				Shri Chaman Lal, C.A.R.U.
				Shri Thakkar Das Mehra, Truck Operations Union & Indian Roads Federation.
				Shri Satye Pall Gaggi, President, Delhi Bus Operators Association.
				Shri L.C. Saxena, Delhi Transporters' Association.
				Shri D.R. Chopra, Secretary, Delhi Truck Operators Association, Naya Bazar, Delhi.

Sr. No.	Date	State	Venue & Date	Parties Interviewed
				Shri M.L. Bahri, All India Motor Union, Indian Institute of Road Transport.
				(a) State Govt. Officials
10.	2-7-71 to 5-7-71	Gujarat	Ahmedabad Circuit House 2-7-71 to 3-7-71	Shri Bhupendra B. Gajjar, Asstt. Engr. (Road), A.M.C. Shri Jayant Shukla, Transport Manager, A.M.T.S. Shri K.D. Sardar, Div. of Traffic, A.M.T.S.
				Shri S.J. Bardy, R.T.O., Rajkot.
				Shri J.D. Dhur, D.T.O., G.S.R.T.C.
				Shri P.M. Kane, D.T.O., G.S.R.T.C.
				Shri S.A. Desai, Chief Traffic & Comm. Manager.
				Dy. S.P., S.T.B.
				Shri S.R. Derasari, Dy. General Manager, S.R.T.C.
				Shri H.S. Chaya, I.A.S., Director of Transport, G.S.
				Shri K.G. Badlani, I.A.S., Secretary, Home Department, G.S.
				Shri S. Dhana Chowdhary, DIG (CID).
				Shri V.S. Guman, D.C.P. (Traffic).
				Shri B.S. Narula, D.C.P., Ahmedabad City.
				Shri M.C. Joshipura, R.T.O., Ahmedabad.
				Shri A.H. Gandhi, Dy. Engr., A.M.C.
				(b) Non-officials
				Shri Norothamdas K. Jhaveri, Mayor of Ahmedabad.
				Shri Jehangir Cama, Gujarat Chamber of Commerce.
				Shri R.V. Vasa, Gujarat Chamber of Commerce.
				Shri L.V. Dani, Gujarat Chamber of Commerce.

Sr. No.	Date	State	Venuo & Date	Parties Interviewed
				Shri B.M. Jhagabhaiwala, Gujarat Chamber of Commerce.
				Shri J.P. Shah, Gujarat Chamber of Commerce.
				Shri P. Ghaudasama, Branch Secy., W.I.A.A.
				Shri Hasmukhbhai Parikh.
				Shri M.G. Brahmbhatt, Headmaster's Association.
				Shri S.N. Patel, Vahan Vahak Co-op. Society Ltd., Ahmedabad.
			Baroda (Circuit House) 5-7-71	*State Govt. Officials and Non-officials*
				Shri H.S. Chhaya, Director of Transport Ahmedabad.
				Shri R.N. Elavia, R.T.O., Baroda.
				Shri H.C. Boyece, R.T.O., Surat.
				Shri R.G. Barot, Dist. Supdt. of Police Baroda City.
				Shri Y.B. Jhala, D.S.P., Baroda Dist.
				Shri A.M. Desai, Dy. Supdt. of Police, Boroda.
				Shri Sakarlal M. Shah, Chamber of Commerce.
				Shri R.C. Desai, Information Officer, Broda.
				Shri D. Narandas, Marfatias Representative.
				Shri N.B. Patel, City Engineer, Municipal Corp.
				Shri Sethia, Architect, Baroda Municipal Corporation.
				Shri Chaudhan, Suptd. Engineer, P.W.D. Baroda.
				Shri B. Makwana, President, Hand-cart owners Association.
				Shri Jivanlal Thakkar.
				Shri Rusi Contractor, Legal Adviser to Auto-rickshaw Assn.
				Shri M.S. Kadri, Secy., Auto-rickshaw Assn.

Sl. No.	Date	State	Venue & Date	Parties Interviewed
				Shri M. Ranalkar, President, Auto-rickshaw Assn.
				Shri S. Shukla, President, Secy., Teachers Association, Baroda.
				Shri Nagarbhai Patel & Shri Nathwani.
11.	29-7-71 to 1-8-71	Rajasthan	Jaipur 29-7-71	(*a*) *State Govt. Officials*
				Shri G.S. Nandivorl, Senior Town Planner.
				Shri B.C. Vaidya, Chairman U.I.T. Jauipur.
				Shri Narain Sinha, Director of Tourism.
				Shri Vishun Datt, Dy. Ditector of Tourism.
				Shri Durga Prasad, Chief Engr. (Roads).
				Shri V.N. Lalla, Addl. Chief Engr. (Road).
				Shri Kapla Supdt., Engr. P.W.D., Jaipur.
				Shri N.B. Sadasukhi, Director, Local Bodies.
				Shri B.K. Sharma, Commissioner, M.C., Jaipur.
				Shri H.S. Barhi, Asstt. Director, Local Bodies.
				Shri C. Gupta, Dy. Secretary to Calculation Dept.
				Shri S.K. Bali, R.T.O., Jaipur.
				Shri Govind Negam, Mobile T.I., Jaipur.
				Shri B.R. Sharma, Dy. Supdt. of Police, Traffic, Jaipur.
				Shri Ranga, Director of Transport.
				Shri Surendra Sharma, Addl. S.P. C.I.D. (C.B.), Jaipur.
				Shri Govind Singh, AIG (T).
				Shri R.S. Kamat, Dy. Secretary, (Home Dept.).
				Shri Sultan Singh, I.G. P., Rajasthan.
				Chairman, R.S.R.T., Corporation.

Sl. No.	Date	State	Venue & Date	Parties Interviewed
				(*b*) *Non-Officials*
				Jaipur Transport Operators Association, (Goods).
				Representatives of All Rajasthan Bus Operators. Union, Jaipur.
				Central Transport, Jaipur.
			Udaipur	(*a*) *State Govt. Officials*
			31-7-71	Shri A.C. Sethi, R.T.O., Udaipur.
				Shri S.M. Mathen, Asstt. Director of Transport.
				Shri S.L. Khasgiwala, Commissioner, Municipal Council, Udaipur.
				Shri M.S. Madhok, I.P.S., Udaipur.
				(*b*) *Non-Officials*
				Shri M.S. Chaippa, Manager, Janta Bus, Udaipur.
				Shri I.Y. Pandey, President, Bus Operators Union.
				Shri J.P. Chokey, Editor,'Youth'.
				Shri Ram Chandra.
				Shri Jaidish Verma.
				Shri Tripathi.
12.	19-8-71 to 20-8-71	Maharashtra.	Sholapur 19-8-71	*State Govt. Officials & Non-officials*
				Shri Ramachandran, S.P., Sholapur.
				Shri Patankar, R.T.O., Poona.
				Shri M.G. Phadke, Divl. Controller, S.T., Sholapur.
				Shri B.H. Jagdev, Police Inspector, S.T.B., Bombay.
				Shri S.G. Thake, Dy. Engineer, T.Unit, S.T.B., Bombay.
				Shri C.G. Sayuddi, P.S.I., S.T.B., Bombay.
				Shri M.R. Changadi, P.S.I., S.T.B., Poona.

Sl. No.	Date	State	Venue & Date	Parties Interviewed
				Shri V.D. Phatak, Asstt. Town Planner.
				Shri Kalyani, E. Engineer, S.T.B. T.E., Bombay.
				Shri N.G. Dube, Ex. Engineer, B & C ., Sholapur.
				Prof. B.K. Pujari, Director of Physical Education.
				Shri S.B. Bubane, City Engineer, S.M.C.
				Shri S.S. Patil, President, Z.P., Sholapur.
				Shri R.M. Wagharde, Chairman, Works Committee, Z.P., Sholapur.
				Shri V.V. Talwalker, Supdt., S.R. Girls High School.
				Shri T.V. Kande, Head Master, D.R. Chandak High School.
				Shri D.G. Pathan, Ex. Engineer, Z.P., Sholapur.
				Shri G.V. Valvekar, Head Master, S.H.N. High School.
				Shri S.K. Pal, Dy. Engineer, B & C Department, Sholapur.
				Shri B. Tone, President, P.S. South, Sholapur.
				Shri L.S. Alkunte, Ex-Chairman, Standing Committee, S.M.C.
				Shri T. More, Representative, Union Co-op. Insurance, Sholapur.
				Representatives of Janta Tourist Office.
				Shri M. E. Patel.
				Kadadi High School, Representative.
				Shri S.R. Mahajan, H.D. High School, Sholapur.
				Shri K. Jadhav.
				Shri R.S. Vyas, Factory Manager, The Jai Mills Co. Ltd.

Sl. No.	Date	State	Venue & Date	Parties Interviewed
				Shri A.N. Malvanlikar, Vice President, Maharashtra Motor Kamgar Sangh. Shri P.S. Shinde. Shri A.S. Kulkarni, Bus Manager, S.M., Transport. Shri B.K. Mane, M.L.A., Sholapur. Shri H. Jadhav, Member, School Board, Sholapur. Shir M.N. Deodhar, Vice Chairman, Municipal School, Committee. Shri A.P. Brahmanalkar, General Secretary, S.T. Kamgar Union. Shri S.H. Gaikward, President, Transport Committee, S.M.C. Shri Shivdare, M.L.A. Smt. Jugan Byas. Smt. Indumati Salghekar. Smt. Chanchaladeavi Gandhi. Smt. Nirmala Thakal, Member, S.M.S. Smt. Parvati P. Dage. Smt. Pramila Yemane. Shri Shankar Chowgule. Shri S.A. Pujari. Shri Kontam, Dy. Mayor, S.M. Corporation. Shri Abdul Sathar, Social Worker. Shri A.M. Yelara, Head Master, Sidheshwar High School. Comrad Mandur, Communist Party Worker. Shri Bhangare, Goods Truck Agent. Shri G.M. Shah, Regional Manager, Union Co-op. Insurance, Sholapur.
13.	24-11-71 to 26-11-71	Andhra Pradesh	Hyderabad 24-11-71	(*a*) *State Government Officials.* Shri Gopal Naidu, Transport Minister, Andhra Pradesh.

Sr. No.	Date	State	Venue & Date	Parties Interviewed
				Shri E.V.M. Reddi, Secretary, Home Dept. A.P. Government.
				Shri K. Ramachandra Reddi, Dy. Secretary of Police.
				Shri Guru Das, Transport Commissioner.
				Shri K.V.S. Suryanarayana, G. M., A.P.S.R.T.C.
				Shri Venu Gopal Reddy, Joint Director of Town Planning
				Shri M.P.V. Anata, Director o Operation, A.P.S.R.T.C.
				Shri G.L. Balakrishna Reddi, Secretary, State Transport Authority, Hyderabad.
				Shri K.N.V. Nair, I/C SE Municipal Corporation of Hyderabad.
				Shri P. Sayanna, City Engineer, Municipal Corporation of Hyderabad.
				Shri C. Somi Reddi, Asstt. Commissioner of Police (Traffic), Hyderabad.
				Shri P. Vaman Rao, Director of Public Relations & Town and Joint Secretary Andhra Pradesh.
				Shri J. Apparao, Dy. Transport Commissioner, Kakinada.
				Shri R. Krishnamurthy, Dy. Chief Engineer (Roads & Buildings).
				Shri K.A. Narayanaswamy, Dy. Commissioner of Police (Traffic) Hyderabad.
				Shri G.V. Krishna Reddi, Dy. Transport Commissioner.
				Shri C. Ramarao, Dy. Transport Commissioner, Secretary, R.T. A.
				Shri C.N. Shastry.
			Hyderabad 25-11-71	Shri C. Somi Reddi, Asstt. Commissioner of Police (T), Hyderabad.

Sr. No.	Date	State	Venue & Date	Parties Interviewed
				Shri B. Kashinath, Asstt. Commissioner, of Police, Traffic-II, Hyderabad.
				(b) *Non-Officials.*
				Shri K. Venkateswarlu, M.L.A.
				Rev. Fr. A. Udumula, St. Patrick's High School, Secunderabad.
				Rev. Fr. A.M. Reddi, St. Mary's High School, Secunderabad.
				Shri S.B. Prasadh Rao, Secretary, Hyderabad Rickshaw Drivers' Union, (I.N.T.U.C.).
				Shri Mirza M. Ali, Beg, General Secretary, Rickshaw Owners Union.
				Shri Md. Akbar, Ali, Gen. Secy. R.O.A.
				Shri A.A. Khan, Vice Persident, Rickshaw Drivers' Union, I.N.T.U.C.
				Shri S.K. Hassan, general Secretary, Hyderabad Motor Union.
				Shri M.Y. Khan, A.P. Motor Vehicle Owners' Association.
				Shri K.V. Subbarao.
14.	10-2-72 to 12-2-72	West Bengal	Calcutta 10-2-72 & 11-2-72	(a) *State Government Officials.*
				Shri S.N. Roy, Dy. Secretary, Home (Transport) Department.
				Shri K.B. Chakraborti, Administrator, C.T.C.
				Shri P.K. Mazumdar, Chief Operating Manager, C.T.C.
				Shri M.K. Chatterjee, Director, Road and Building Research Institute, P.W.D.
				Shri M.M. Nandi, Suptd. Engineer, Eastern Circle, P.W.D.
				Shri R. Paul, Supdt. Engineer, Western Circle, P.W.D.
				Shri S. Mitra, chief Engineer, Calcutta Corporation.

Sr. No.	Date	State	Venue & Date	Parties Interviewed
				Shri P.C. Bhattachary, D.C. Traffic Police, Calcutta.
				Shri A.K. Bandopadhyaya, Executive Engineer (Traffic), C.M.R.
				Shri S.K. Majumdar, Director of Operation, C.S.T.C.
				Shri D. Chakraborti, Asstt. Secretary, Home (Transport).
				Shri R. Ghosh, Transport Commissioner, Calcutta.
				Shri P.K. Basu, I.G.P., Calcutta.
				Shri A.K. Paul, D.I.G.P. Traffic & Railways.
				(b) *Non-officials.*
				Shri S.S. Roy, Taxi Drivers' Union, Calcutta.
				Shri S.K. Roy, -do-
				Shri S. Banerjee, -do-
				Shri B.K. Deb, Bengal Taxi Association.
				Shri P.K. Gosh, Calcutta Taxi Association.
				Shri K.K. Chatterjee, -do-
				Shri T.M. Bari, -do-
				Shri Gurdayal Singh, Hon. Secretary, Bengal Bus Syndicate.
				Shri S.K. Ganguli, I.R.T.D.A., Calcutta.
				Shri S.K. Mitra, Hon. General Secretary, Federation of Bus Syndicate.
				Shri Kalyan Bhadra, General Secretary, Bengal Taxi Association.
1.	17-5-71	Himachal Pradesh (Hill Areas)	Simla 18-5-71	(a) *State Govt. Officials and Non-officials.*
				Shri Y.R. Vendhy, Automobile Manager.
				Shri A.D. Arora.
				Shri B.H. Hande, S.R.O H.G.T.

Sr. No.	Date	State	Venue & Date	Parties Interviewed
				Shri R.R. Varma, A.I.G.
				Shri Ajit Kumar, W.M, H.G.T.
				Shri Y.D. Sanedhye, G.M. (C), H.G.T.
				Shri Ramji Das, XEN, P.W.D., E.O.-II, Simla-I.
				Shri R.K. Mehta, Town & Country Planner, H.P., P.W.D.
				Shri S.P. Sharma, Engineer (Roads & Buildings), Municipal Corporation, Simla.
				Shri S.S. Vhangal, Dipak Project.
				Shri Ramesh Ratan, H.E.D., Simla.
				Shri Anant Ram.
				Shri Prem Singh, President, (A.I.T.U.C.T.A.).
				Shri B.M. Bakshi, A.I.T.U.C.T.A.R.A.D.
			Chamba 20-5-71	(b) *State Govt. Officials and Non-officials.*
				Shri Ajit Kumar, Works Manager, H.G.T., Simla.
				Shri J. Duhat, S.P. Railways & Traffic, H.P.
				Shri Satya Prakash, Transport.
				Shri Gopinath, R.A., H.G.T.
				Shri A.N. Vidyarthi, D.C.
				Shri Surat Ram, G. Section.
				Shri S.S. Mahajan, Editor, Prop. Rama & Agency, Chamba, H.P.
				Shri Dharama Paul, Secretary, Chamba Wholesale Karyana Dealers.
				Shri Ram Prakash, President, H.T.W.U., Chamba.
				Shri M.C. Padam, S.D.M., Chamba.
				Shri B. Puri.
				Shri Sagan Chand.

Sr. No.	Date	State	Venue & Date	Parties Interviewed
				Shri G.S. Singh, Govt. H. Section, C.L.M., Chamba.
				Shri Baldev Singh.
				Shri S. Lal, President, Chamba, M.C.C.
				Shri S.P. Punchwari, XEN, Chamba.
				Shri S.K. Malhotra, XEN, Churah Div.
				Shri M.C. Vakil, XEN, Chamba.
2.	4-11-71 to 8-11-71	U.P. (Hill Areas)	Gopeshwar (U.P.) 7-11-71	(a) *State Govt. Officials & Non-officials.*
				Lt. Col. M.S. Sethi, Commander, 21, BRTF C/o 56 APO.
				Shir Y.K. Gupta, Ex. Engineer, P.W.D., Gopeshwar.
				Shri A.P. Naithani, for Dy. S.P. CMI.
				Shri P.S. Bhakani, Passenger Road, Supdt. Srinagar.
				Shri A.S. Rana, Traffic Manager, G.M.O.U. Ltd., Kotdwara.
				Shri D.V.S. Mall, S.D.O. Hydel, Chamoli.
				Shri Vikram Singh Rawat, Advocate, Youth Congress President, Chamoli.
				Shri D. Bhatt, Editor, Uttarakhand Observer, Gopeshwar.
				Shri Surendrasingh Mahamantri.
				Shri D.P. Arya, District Magistrate, Chamoli,.
				Shri R. Vaishnav, Rudraprayag.
				Shri Chandrasekar Sathwal, S. N.V. Rudraprayag.
				Shri L.K. Pande, Executive Engineer, Chamoli.
				Shri D.K. Lahoti, Executive Engineer, S.N.V. Karnaprayag.
				Shri Harichandra, Executive Engineer, Chamoli.
				Shri R.S. Rangaswamy, Officer Commanding, 7 RMU C/o 56 APO.

Sr. No.	Date	State	Venue & Date	Parties Interviewed
				Shri N.L. Hari, Asstt. R.T.O. Dehradun.
				Shri G.K. Pant, Lecturer, G.I.C., Gopeshwar.
				Shri N.S. Negi, Secretary, Gopeshwar.
				Shri J.L. Shah, Chamoli.
				Shri K.S. Rana, Manager, Simant Sahakari Sangh Ltd., Chamoli.
				Shri D.N. Chandola, Engineer, AZP, Chamoli.
				Shri Naren Singh.
				Shri Ram Singh.
				Shri Pratap Singh.
			Rishikesh 8-11-71	(b) *State Govt. officials & Non-officials.*
				Shri S.B. Mathru, Addl. Chief Engineer, P.W.D.
				Shri N.P. Bhatnagar, Executive Officer Nagarpalaka, Rishikesh.
				Shri S.N. Ray, S.E. E/M, P.W.D. Lucknow.
				Shri B.K. Agarwal, S.E., P.W.D. Dehradun.
				Shri G.D. Tendari, General Manager, Front Roadways.
				Shri K.C. Khari, Deputy Transport Commissioner, (Tech.) U.P., Lucknow.
				Shri Ramprakash, Executive Engineer, P.W.D.
				Shri R.S. Rangaswamy, Officer Commanding, RMU (GREF), C/o. 56 APO.
				Shri R.K. Sharma, Executive Engineer, Provisional Division, Pauri, Gardhwal.
				Shri S.G. Gupta, A.R.I. Ltd., DDN Region, Rishikesh.
				Shri Ananthram.
				Shri D. Singh.

Sr. No.	Date	State	Venue & Date	Parties Interviewed
				Shri Shiv Chand Kumar.
				Shri M.S. Sharma, Secretary.
				Shri S.T.B. Saxena, P.T.I., Correspondence, Hardwar.
				Shri R.S. Das, R.T.O. (Supdt.), Shrinagar.
				Shri C.S. Sanwal, Executive Engineer, P.W.D. Rudraprayag.
				Shri Mangal Singh, Journalist.
				Shri Prahlad Singh, Taxi Union, Rishikesh.
				Shri B. Thyaghi, Journalist.
				Shri H.C. Gupta.
				Shri S.P. Ganga, Secretary, Shri Gangaji Truck Motor Owner, Rishikesh.
				Shri K.K. Agarwal, Social Worker.
				Shri M.L. Kohli, Vice President, Lions Club, Rishikesh.
				Shri A.C. Anthone, Asstt. Engineer, E/M, P.W.D. Rishikesh.
				Shri R. Ram P.W.D. Rishikesh.
				Shri Govind Prasad.
				Shri K.T. Gormar.
				Shri V.S. Berimul, M, Nagar.
				Shri Nareshchand Gagi, Executive Engineer.
				Shri R.K. Sharma, Executive Engineer, E/M, P.W.D. Rishikesh.
				Shri L. Nagi, Motor Mechanic, Rishikesh.
				Shri G. Gaman, IAS, Distt. Magistrate, Chamoli.
				Shri D.S. Saxena, P.P., T.W.L.
				Shri O. Prasad, S.E., P.W.D. Uttarkashi.
				Shri D.S. Baxit, Commissioner, G.M.D.U. Ltd., Kotdwara.
				Shri T.S. Sethi, Transport From Rishikesh.
				Shri Jayramkalani.

Sr. No.	Date	State	Venue & Date	Parties Interviewed
				Shri Danesh Sastry, Sachiv Uttarkhand Transport Co., Rishikesh.
				Shri J.P. Agarwal, R.T.O.
				Shri S.R. Gupta, P.W.D. Rudraprayag.
				Shri Ram Kumar, A.E. P.W.D., Rudraprayag.
				Secretary, T.G. Motor (P) Ltd.
				Shri R.N. Sharma, D.I.O.S., Pauri.
				Shri Karmali.
				Shri Premchand Kumar, Driver.
				Shri Jaganath, Driver.
3.	29-2-72 to 5-3-72	Tamil Nadu & Mysore (Hill Roads)	Madurai 29-2-72	*Officials and Non-officials.*
				Shri W.P.A.R. Nagarajan, Vice-Chairman, Kodai Township.
				Shri K. Govindan, R.T.O., Maduari.
				Shri K.S.M. Abdul Khader, Asstt. Engineer (H) Traffic Engg. Cell, Madras-25.
				Shri V.S.R. Chanra, South India Travel Agency, Madurai-1.
				Shri J. Swamidass, Member, Kodaikanal Township, Kodaikanal.
				Shri S. Satyappan, Joint, R.T.O., Madras.
				Shri R.C. Jayaraj, B.E., Dy. Supdt. Tamil Nadu State Transport Deptt., Madurai-1.
				Shri P. Kanakaratnam, B.E. Asstt. Engineer (H. & R.W.), Butlagundu.
				Shri Ramdoo Rao, Divisional Engineer (Highways) Dindigul.
				Shri S.M. Subramanian.
				Shri C. Raghavan, Divisional Engineer (Highways), Traffic Engineering Cell, Madras-25.
				Shri J. Vasudeva Bhat, Supdt. of Police, North Madurai.

Sr. No.	Date	State	Venue & Date	Parties Interviewed
			Coimbatore 2-3-72	*Officials and Non-officials.*
				Shri K. Mohamed Ali, Asstt. Engineer, Traffic Enggr. Cell Madras-25.
				Shri P.S. Gopalan, Staff Correspondent, Indian Express.
				Shri X. Venkataraman, B.E., Divisional Engineer, Coimbatore.
				Shri A. Kesavan, Dy. Director of Town Planning, Coimbatore.
				Shri L.G. Ramamurthy, L.G.B. & Brothers, Trichy Road, Coimbatore.
				Shri E.V. Ananta Narayanan, Pierce Leslie, Coimbatur.
				Shri K. Kandaswamy, Supdt. of Police, Coimbatur.
				Shri P. Ganesan, R.T.O., Coimbatore.
				Shri A. Periaswamy, -do-
				Shri S. Venkatachalam, -do
				Shri K. Radhakrishnan, D.I. G. of Police.
				Shri L.M. Joseph, R.T.O., Ooty.
				Shri G.D.C. Jesudasan, Motor Vehicles Inspector.
				Shri L.V. Srinivasan -do-
				Shri Jayakantan, A.M.V.I.
				Shri C.A. Krishnan, P.T.I.
				Shri V. Padmanathan, The HINDU.

ANNEXURE 7

GOVERNMENT OF INDIA

Ministry of Shipping & Transport
(Transport Wing)

No. 19-T(18)/70 *New Delhi the* 31-3-1971.

To

All State Govts. and Union Administrations
(Department dealing with Road Transport)

SUBJECT:—Constitution of a Sub-Committee of the Study Group on Road Safety.

Sir,

In supersession of this Ministry's letter No. 19-T(18)/70 dated 10-3-71, I am directed to say that a Sub-Committee of the Study Group on Road Safety has been constituted to consider specifically, the problems of road accidents in the hill areas of the country and suggest measures to prevent them. The composition of the Committee will be as follows:—

(1)	Shri Tulsidas Jadhav, 1/95. Mitra Nagar, Sholapur (Maharashtra)	*Chairman*
(2)	Dr. N.S. Srinivasan, Head of Traffic and Transport Division, Central Road Research Institute, Mathura Road, New Delhi-20.	*Member*
(3)	Col. U.S. Anand, Chief Engineer, project Deepak, C/o 56-APO	*Member*
(4)	Shri R. P. Sikka, Superintending Engineer (Roads), Min. of Shipping & Transport, (Roads Wing), New Delhi.	*Member*
(5)	Shri C.L.N. Iyengar, 121, Maharishi Karee Road, Bombay-20 BR.	*Member*
(6)	Shri K.G. Subramanian, Secy. of the Study Group on Road Safety, C/o Western India Automobile Association, 76, Vear Nariman Road, Churchgate Reclamation, Bombay-20 BR.	*Secretary*

2. The Chairman and members of the Sub-Committee may visit hill areas in the concerned state to hold discussions with representatives of the State Governments etc. and to record evidence of the others interested in the work of the Sub-Committee. It is requested that the State Government/Union Administration may kindly assist the Chairman and members of the Sub-Committee in getting residential accommodation and provide transport—and other facilities to them on such occasions on hearing from the Secretary of the Sub-Committee or the Dy. Secretary of the main Group.

Kindly acknowledge receipt of this letter.

Yours faithfully,

Sd./-
(K. C. JOSHI)
Dy. Secy. to the Govt. of India.

ANNEXURE 8

GOVERNMENT OF INDIA

MINISTRY OF SHIPPING AND TRANSPORT

(Transport Wing)

STUDY GROUP ON ROAD SAFETY

Sub-Committee on Road Accidents in Hill Areas

A. Questionaire

1. What in the opinion of the State Government were the main causes of accidents on the hill roads in their States?
2. State Government's own suggestions as to the remedial measures to be adopted for cutting down the accident rate;
3. Relevant statistical information such as the year by year number of road accidents on hill roads in the State concerned, the hill road kilometrage along with breake-up according to the Geometric Standards and road surface condition and the traffic volume categories for every important roads;
4. Any notable accident black spots on the hill roads within the jurisdiction of the State together with accident figures for past 5 years and known causes, site plan and if available, traffic data.

B. Data Sheet

This Data Sheet is required to be prepared separately for each road. It is desirable that data should be given for as many years as possible.

1. Name of road
2. Length
3. Overall width
4. Width of carriage way
5. Specification of carriage way
6. Existing maximum gradient
   minimum superelevation
   minimum radius of curve
7. Allowable maximum gradient
   minimum superelevation
   minimum radius of curve

8. General maintenance state of road-indicate in terms of good/average/poor

9. Width of bridges-inside kerbs

10. Climatic conditions

11. Closure period of road during the year, taking into consideration climatic conditions

12. Traffic arrangement—
    Whether gate permit system in use for free two way traffic allowed

13. Permissible speed limit

14. Permissible load limit

15. Number of fatal accidents—give month-wise details

16. Number of non-fatal accidents—give month-wise details

17. Causes of accidents, in case of magisterial enquiry has been conducted

18. Traffic census-daily average, for each month :—
    (a) Light vehicles (with pay loads than 3 tons)
    (b) Heavy vehicles (with 3 tons or more pay load).

ANNEXURE 9

Answers to the questionnaire and other memorandum received by the Study Group on Road Safety (Sub-Committee on Road Accidents in Hill Areas).

1. Notes on Road Safety Measures submitted to the Study Group on Road Safety by Supdt. of Police, North Madurai, Madurai.
2. Answers to the questionnaire from Regional Transport Officer, Coimbatore.
3. Data sheet showing the details of the road between Agumbe and Someshwara in Shimoga District by Executive Engineer, Shimoga Division, Mysore P.W.D.
4. Answers to the questionnaire and data sheet showing the details of Mangalore-Udipi-Shimoga Road, by Supdt. of Police, Shimoga District.
5. Statement showing the details of Traffic volume and intensity of Ghat-Roads revealed in the traffic census conducted in January 1971, by Statistician, P.W.D.
6. Answers to the questionnaire and data sheet of Mercara-Mangalore Road by Executive Engineer, Coorg Division.
7. Answers to the questionnaire and data sheet showing details of Mercara-Fraserpet Road by Executive Engineer, Coorg Division.
8. Answers to the questionnaire by Supdt. of Police, Coorg District.
9. Answers to the questionnaire and data sheet showing the details of Shimoga-Mangalore Road.
10. Answers to the questionnaire and data sheet showing the details of Mysore Mercara-Mangalore Road.
11. Answers to the questionnaire and the details of accidents during past 5 years with accident-prone spots on Kadaikanal Ghat Road by Regional Transport Officer, Madurai.
12. Sample Survey of Road Traffic conducted during the year 1969-70 in Mysore State by Government of Mysore, Public Works Department.
13. The Mysore Law Journal, Page No. 410.
14. Details of the accident-prone spots and the answers to the questionnair received from the Regional Transport Officer, Nilgiris.

ANNEXURE 10

From A-1—Road Accident Report Form

I. *General:*

(a) Site of accident
(b) Date of Accident
(c) Day of week
(d) Time of accident . . . . Number

II. *Description and registration number of vehicles primarily involved:*

(a) Motor cycle solo without pillion
(b) Motor cycle solo with pillion
(c) Motor cycle with side car
(d) Motor car without trailer
(e) Motor car with trailer
(f) Motor cab
(g) Public service vehicle other than Motor cab
(h) Goods vehicle without trailer
(i) Goods vehicle with trailer
(j) Other class of motor vehicles (describe)
(k) Class of vehicle not known
(l) Registration number

Total:

III. *Nature of accident:*

(a) Collision with, or avoidance of :
  (i) Other motor vehicle (including road roller) (describe)
  (ii) Tram car
  (iii) Cyclist
  (iv) Cycle rickshaw or other form of pedal tricycle
  (v) Bullock-cart
  (vi) Vehicle drawn by animals other than bullocks
  (vii) Rickshaw other than tricyle rickshaw or hand-cart
  (viii) Pedestrian

(ix) Animal ridden . . . . . .
(x) Animal loose . . . . . .
(xi) Tree . . . .
(xii) Train at unguarded level crossing gates . .
(xiii) Level crossing gates . . . . . .
(xiv) Other fixed object (describe) . . . .

(b) Other kind of accident
(i) Overturning . . . .
(ii) Other than (overturning). . . . .

From A-1—Presently in use

IV. *Primary cause of accident:*
(a) Fault of driver of motor vehicle
(b) Fault of driver of vehicle other than a motor vehicle.
(c) Fault of cyclist
(d) Fault of pedestrian
(e) Fault of passenger
(f) Defect in mechanical condition of motor vehicle
(g) Defective road surface
(h) Road berm soft or defective
(i) Result of weather conditions (*e.g.* mist, fog, heavy rain, strong wind, dust storm, etc.)
(j) Other cause
(k) Cause not known

V. *Light conditions:* Number

(a) Day light . . . .

(b) Dusk . . . .

(c) (i) Dark with good street lights . . . .
(ii) Dark with poor street lights . . . .
(iii) Dark with no street light . . . .

VI. *Road and traffic conditions:*

1. Road conditions :—

(a) (i) Built up area . . . .
(ii) Unbuilt up area . . . . . .

(b) (i) Straight road . . . . . .
(ii) Bend in road . . . . . .
(iii) Intersection . . . .

(c) (i) Flat road
  (ii) Hill road
(d) (i) Dry road
  (ii) Wet road
(e) (i) Surfaced road
  (A) Concrete
  (B) Black topped
  (C) Metalled
  (ii) Earth or Kutcha road

2. Traffic conditions :—
(a) (i) Dense traffic
  (ii) Light traffic
  (iii) Moderate traffic.
(b) (i) Controlled junction
  (ii) Uncontrolled juncton.

VII. Responsibility of driver of motor vehicle primarily concerned.
(a) Sex
(b) Age
(c) How long driving (years)
(d) (i) Qualified
  (ii) Unqualified
  (iii) Qualification not known
(e) Intoxicated
(f) Asleep or inattentive
(g) Speeding
(h) Violated other provisions of the tenth schedule of the Act.

VIII. Particulars of motor vehicle primarily concerned.
(a) Age of vehicle
(b) Overloaded
(c) Defective brakes
(d) Defective steering
(e) Puncture or burst
(f) Other serious mechanical defects (describe)
(g) Left hand steering
(h) In the case of transport vehicles only
(i) Particulars of certificate of fitness including date of issue and expiry and by whom issued

IX. Responsibility of pedestrian or other person involved.
(a) Pedestrian's age
(b) Pedestrian deaf, blind or otherwise infirm

(c) Pedestrian walking along road

(d) Pedestrian crossing or running into road

(e) Persons mounting or alighting from vehicle

(f) Pedestrian intoxicated

(g) Pedestrian's view obstructed

(h) Pedestrian confused by traffic

(i) Child playing on roadway

(j) Person standing and talking in roadway

	Killed	Injured
X. Casualties-Persons.		
(a) on motor vehicle.		
(i) Professional driver		
(ii) Other driver		
(iii) Rider of motor cycle		
(iv) Passengers other than driver or rider .		
(b) On other vehicle (including both driver and passengers).		
(i) Bullock cart		
(ii) Vehicle drawn by animals other than bullocks		
(iii) Cyclist		
(iv) Person riding on animals . . .		
(v) Rickshaw or hand cart puller . .		
(c) Pedestrian.		
(d) Not known.		
Total of (A) to (D)		

XI. Were the Motor vehicle (s) involved covered by insurance to the extent required by the Motor Vehicles Act, 1939.

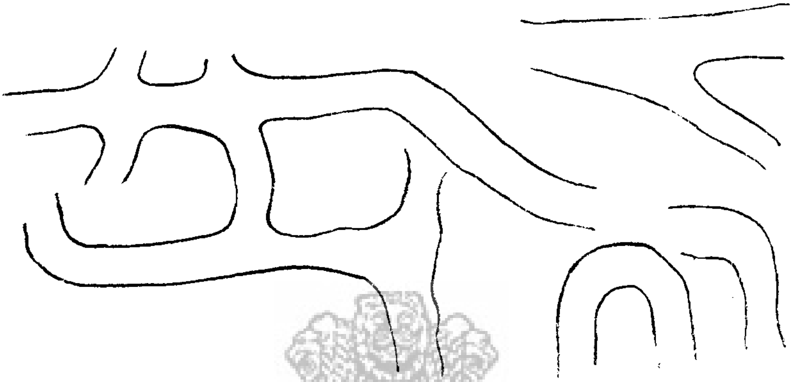
XII. Brief description of accident including cause.

Instructions for filling in the Road Accident Report Form.

Except where specific information is required *e.g.* the age of the driver, or the date of the accident etc. it will be sufficient if the word 'yes' is written only whenever an answer is applicable.

Site of accident.—The sketches below represent a number of road situations. If the Accident occurred at any situation illustrated in the sketch, mark as near as you can the position and direction of the vehicle or vehicles immediately before the accident with an arrow head and the letter P or S for "Vehicle Primarily" or "Vehicle Secondary" concerned.

Thus P S



Name of persons Killed Addresses

Name of persons Injured Addresses

WITNESS

XIII. Result of investigations and Court proceedings where known.

ANNEXURE 11

FORM-4*

Statement Containing Particulars of Motor Vehicle Accidents Brought to the Notice of the Authorities in the State of....................for the year ending December 19——.

I. Total No. of accidents in which vehicles were involved during each of the month of the year.	**Number**
January	
February	
March	
April	
May	
June	
July	
August	
September	
October	
November	
December	
Total	

II. Class of motor vehicles involved (or if two motor vehicles are involved, class of motor vehicles primarily concerned).	
a. Motor cycles	
b. Motor cycles with side car	
c. Auto Rickshaws	
d. Motor cars without trailer	
e. Motor cars with trailer	
f. Jeeps	
g. Motor cars	
h. Public service vehicles other than motor cars	
i. Goods vehicles without trailer	
j. Goods vehicles with trailer	
k. Other classes of motor vehicles.	
l. Class of motor vehicles not known.	
Total	

---

*Form 4 presently used in the country.

III. Nature of accidents

(a) Collision with:

- (i) Other motor vehicles (including road roller)
- (ii) Tram cars
- (iii) Cyclists
- (iv) Cycle rickshaws or other forms of Pedal tricycle
- (v) Bullock carts
- (vi) Vehicles drawn by animals other than bullocks
- (vii) Rickshaws other than tricycle rickshaws and hand-carts.
- (viii) Pedestrians
- (ix) Animals ridden
- (x) Animal loose
- (xi) Trees
- (xii) Trains at Unguarded level crossing gates
- (xiii) Level Crossing Gates
- (xiv) Other fixed objects

(b) *Other kinds of accidents*	**Number**
(i) Overturning	
(ii) Others	
Total	

IV. Primary cause of accidents

(a) Fault of driver of motor vehicle	
(b) Fault of driver of vehicles other than a motor vehicle	
(c) Fault of cyclist	
(d) Fault of pedestrian	
(e) Fault of passenger	
(f) Defect in mechanical condition of motor vehicle	
(g) Defective road surface	
(h) Road berm soft or defective	
(i) Result of weather conditions (e.g. mist, fog, heavy rain, strong wind, dust storm, etc.)	
(j) Other causes	
(k) Cause not known.	
Total	

V. Time of day

(a) Day light . . . .
(b) Dark . . . .
(c) Time not known . . . . . .

Total: ____________

VI. Features of the road

(a) (i) Built up area . . . .
(ii) Un-built up area . . . .

Total: ____________

(b) (i) Straight road . . . . . .
(ii) Bend in road . . . .
(iii) Intersection. . . . .

Total: ____________

(c) (i) Flat road . . . . . .
(ii) Hill road . . . .

Total: ____________

(d) (i) Dry road . . . . . .
(ii) Wet road . . . .

Total: ____________

(e) (i) Surfaced road . . . . . .
A. Concrete . . . .
B. Black topped . . . . . .
C. Metalled. . . . .
(ii) Earth or Kutcha road . . . .

Total: ____________

	Number
VII. Particulars and responsibility of driver of motor vehicle (or if two motor vehicles are involved the motor vehicle primarily concerned):	
A. a. (i) Male	
(ii) Female	
(iii) Sex not reported	
Total	
b. (i) Age under 21 years	
(ii) Age not less than 21 years and not more than 50 years	
(iii) Age over 50 years	
(iv) Age not known	
Total	
c. (i) Qualified	
(ii) Unqualified	
(iii) Qualification not known	
Total	
B. (i) Intoxicated	
(ii) Fell asleep	
(iii) Speeding	
(iv) Violated other provisions of the tenth schedule to the Act	
(v) Failed to stop after, or report accident. . .	
Total	
VIII. Particulars of motor vehicles (or, if two motor-vehicles are involved, motor vehicle primarily concerned).	
a. (i) Age of vehicle not more than 5 years . .	
(ii) Age of vehicle 5 years or more . . .	
(iii) Age of vehicle not known	
Total	

b. Overloaded
c. Defective brakes
d. Defective steering
e. Insufficient or no lights
f. Puncture or burst
g. Other serious mechanical defects
h. Left hand steering
i. In the case of transport vehicles only:
    i. Certificate of fitness in force
    ii. Certicficate of fitness not in force
    iii. Particulars of certificate of fitness not known.

Total :

IX. Particulars and responsibility of pedestrian or other persons involved.

a. Pedestrians:
    i. Under 15 years of age
    ii. 15 years to 60 years inclusive
    iii. Over 60 years of age.

Total :

b. Pedestrian deaf, blind or otherwise infirm
c. Pedestrian walking along road
d. Pedestrian crossing or running into road
e. Persons mounting or alighting from vehicle
f. Particulars of pedsetrian not known.

Total :

C. *CASUALTIES—Persons* :	*Killed*	*Injured*
a. On motor vehicles:—		
i. Professional drivers		
ii. Other drivers		
iii. Riders of Motor cycles.		
iv. Passengers other than drivers or riders.		
Total :		

b. On other vehicles (including both drivers and passengers):—
  - i. Bullock carts
  - ii. Vehicles drawn by animals other than bullocks
  - iii. Cyclists
  - iv. Persons riding on animals
  - v. Rickshaw and hand cart puller

Total :

c. Pedestrians

d. Not known

Total : (a to d)

ANNEXURE 12

ROAD SAFETY PATROL

Very often, children are involved in accidents. The reason for their being involved is not that they are unaware of the safety rules or that they do not care to follow them but that they get distracted by some excitement which takes place on the road. Being of playful mind, a child's attention is easily diverted to such objects as a kite or a ball which rolls into the street during play and, as such, it does an act which it would normally have refrained from doing. It is at this jucnture that the importance of forming good safety habits comes in, so that at a time of stress or during play, they may act as a safeguard without any conscious efforts on their part.

A scheme to impart Road Safety Education to school children was initiated in the year 1951, whereby some selected students were trained to help their schoolmates to cross safely in the vicinity of their institutions. This was means by which Traffic Safety Education was extended beyond the classroom. The scheme came to be known as the Road Safety Patrol in 1957. This system of shepherding the children to safety has struck roots in Bombay and has also spread to other parts of the country. In Maharashtra there are 337 schools with units of Road Safety Patrols. Formation of such units has helped in preventing accidents to schools children and to build leaders and good citizens.

Each of the schools participating in this scheme organise and run their own Road Safety Patrol Unit under the supervison of an Assistant Warden. A group of schools in turn comes under the directions and guidence of a Warden who works in an honorary capacity. The Warden maintains a liaison between the school and the Traffic Police.

The number of members in a School Patrol is determined by local factors, such as street and Highway conditions, number of intersections, volume of vehicular traffic, school enrolment and the number of school dispersal times. Police may be of assistance in determining the number of patrol members needed and the most strategic locations for them.

A Road Safety Patrol Unit has a minimu of 15 Cadets in the school. Each unit of twenty or more is divided into sections of ten each. Three such sections form a Platoon. Each section is headed by an Assistant Patrol Leader while a Patrol Leader is in charge of a Platoon. Units of less than 20 Cadets have only one Patrol Leader and one Assistant Patrol Leader. There is one Patrol Captain for each unit of thirty or more Cadets.

Functions :

The functions of the School Safety Patrol are :

(i) To instruct, direct and control the members of the student body in crossing the streets and highways at or near schools; and

(ii) To assist teachers and parents in the instruction of school children in safe practice in the use of streets and highways at all times and places.

Section of Cadets :

The Principal of Faculty Sponsor selects Patrol members, either boys or girls who are not below the age of ten years. The method of selection varies with individual school. The best method is the one that results in the selection of the most outstanding members of the study body. As far as possible, patrol members should be selected from the highest grade in school.

In selecting members of the Safety Patrol, the following qualities should be kept in mind:—

1. Leadership.
2. Reliability.
3. Punctuality.
4. Interest in Road safety.
5. Obedience to rules.
6. Balance.
7. Good attendance record.
8. Courtesy.
9. Respect for teachers and classmates.
10. Attitude of service to others.

Patrol service should be voluntary and subject to the written consent of parents or guardians.

Insignia :

The Cadets wear their school uniforms, maroon berets, epaulets on each shoulder with the letters Road Safety Patrol inscribed in yellow, a maroon band with the letters R.S.P. inscribed in yellow to be worn on the left arm between the elbow and shoulder, brown leather belts with brass buckles with the words "Road Safety Patrol" inscribed on the buckles and the R.S.P. emblem below the inscription, maroon whistle lanyards with "thunderer" whistles. A brass coloured R.S.P. badge will be worn on the berets above the left eye. In addition to the prescribed uniforms for Cadets , Assistant Patrol Leaders wear a brass four pointed star on each epaulet, Patrol Leaders wear two such stars on each epaulet and the Patrol Captains wear three such stars.

Hours of Duty :

Patrol members must be at their designated posts every working day at all times where children are due to cross streets or highways in going to or coming from school. They should be at their posts ten to fifteen minutes before opening of the school in the morning, and again for a similar period after the school closes, until all pupils who are not stragglers have cleared out.

Apart from the normal duties, units of the R.S.P. are invited to help the Police in Traffic "Bandobast" at the time of festivals and days of national rejoicing.

The scheme of Road Safety Patrol is the best type of Safety Education that can be imparted to school children. Not only do the members of the R.S.P. help the Police in the very important task of safeguarding their fellow students and of reporting the number of offending vehicles to the Traffic Department for necessary action, but in the process they gain confidence, dignity and a healthy respect for law and order.

ANNEXURE 13

PROPOSED ROAD ACCIDENT FORM A-1*

1. Details for identification:
   - (i) State
   - (ii) City
   - (iii) District
   - (iv) Police Zone/Station
   - (v) Accident Number allotted by Police Station.

1.1 Location :

(i) Classification of road	Code No.
National Highway	1
State Highway	2
District Road	3
Village Road	4
Municipal Road	5
Not stated	9

(ii) Location of area	Code No.
Urban	1
Rural	2
Not Stated	9

(iii) Road for intersection (Specify the Name) Code No.

Type of location	Code No.
Intersection	1
Carriageway	2
Not Stated	9

(iv) Detailed site (The details under this head should be such as to give precise location within a meter)

____

____

---

*Prepared by the Traffic Engineering Committee of the Indian Roads Congress.

(v) Type of area	Code No.
Near school or college	01
Near or inside a village	02
Near a factory/industrial area	02
Near a religious place	04
Near a recreation place/cinema	05
In bazar	06
Near Office complex	07
Near Hospital	08
Other build-up area	09
Unbuild-up area	10

(iv) Narrow bridge or Culvert	Code No.
Yes	1
No.	2

1.2 Date, day and time

(i) Date (specify)

(ii) Month	Code No.
January	01
February	02
March	03
April	04
May	05
June	06
July	07
August	08
September	09
October	10
November	11
December	12

(iii) Day of the week	Code No.
Monday	1
Tuesday	2
Wednesday	3
Thursday	4
Friday	5
Saturday	6
Sunday	7

(iv) Time (also to be mentioned in hours and minutes)

Hour of the day	Code No.
6.00 a.m.– 7.00 a.m.	01
7.00 a.m.– 8.00 a.m.	02
8.00 a.m.– 9.00 a.m.	03
9.00 a.m.–10.00 a.m.	04
10.00 a.m.–11.00 a.m.	05
11.00 a.m.–12.00 Noon	06
12.00 Noon–1.00 p.m.	07
1.00 p.m.– 2.00 p.m.	08
2.00 p.m.– 3.00 p.m.	09
3.00 p.m.–4.00 p.m.	10
4.00 p.m.– 5.00 p.m.	11
5.00 p.m.– 6.00 p.m.	12
6.00 p.m.– 7.00 p.m.	13
7.00 p.m.– 8.00 p.m.	14
8.00 p.m.– 9.00 p.m.	15
9.00 p.m.- 10.00 p.m.	16
10.00 p.m.- 11.00 p.m.	17
11.00 p.m.– 6.00 a.m.	18
Not stated	99

(v) Holiday or not (if yes, describe)

Holiday	Code No.
Yes	1
No	2

2. Classification of accident	Code No.
Fatal	1
Grievous injury	2
Minor injury	3
Non-injury	4

3. Type of vehicles with registration number and objects involved.

Type of vehicle/object	Code. No.	Object/Registration No. of vehicle		
		1	2	3
Motor cycle solo without pillion	01			
Motor cycle solo with pillion	02			
Motor cycle with side car	03			
Motor car without trailer	04			
Motor car with trailer	05			
Auto rickshaw.	06			
Jeep	07			
Motor cab (taxi)	08			
Omnibus (non-articulated)	09			
Omnibus (Articulated)	10			
Other public service vehicle	11			
Goods vehicle without trailer	12			
Goods vehicle with trailer	13			
Articulated goods vehicle	14			
Tractor	15			
Other class of vehicle (Describe)	16			
Tram Car	17			
Cycle	18			
Cycle rickshaw or other form of pedal tricycle	19			
Rickshaw other than tricycle rickshaw or hand cart	20			
Hand drawn vehicle	21			
Bullock cart or other animal drawn vehicle	22			
Class of vehicle not known	23			
Pedestrian	24			
Animal (Ridden)	25			
Animal (Loose)	26			
Tree	27			
Train at unguarded level crossing	28			
Level crossing gate	29			
Other fixed object (specify)	30			
Not stated	99			

4. Nature of accident	Registration Number			
	Code No.	Vehicle 1	Vehicle 2	Vehicle 3
Overturning	1			
Head on collision	2			
Rear end collision	3			
Collision brush/side-swipe	4			
Right angled collision	5			
Skidding	6			
Right turn collision	7			
Others (describe)	8			
Not stated	9			

5. Cause of accident	Code No.
Fault of driver of motor vehicle	01
Fault of driver of vehicle other than a motor vehicle	02
Fault of cyclist	03
Fault of pedestrian	04
Fault of passenger	05
Defect in mechanical condition of motor vehicle	06
Defect in light condition	07
Defect in road condition	08
Result of weather conditions (*e.g.* Mist, fog, heavy rain, hail, strong wind, dust storm, etc.)	09
Other Cause	10
Cause not known	99

6. Light conditions	Code No.
Day light	1
Twilight	2
Dark with good street light	3
Dark with poor street light	4
Dark with no street light	5
Not stated	9

7. Weather conditions

	Code No.
Fine	01
Mist	02
Fog	03
Cloudy	04
Light rain	05
Heavy rain	06
Hail	07
Sleet or snow	08
Strong Wind	09
Dust Storm	10
Very hot	11
Very cold	12
Other extra-ordinary weather conditions (specify)	13
Not stated	99

8. Road conditions

8.1 Geometry of the road :

	Code No.
(*i*) *Geometric features of the road* :	
Straight road	1
Slight curve	2
Sharp curve	3
Inter-section	4
Not stated	9
(*ii*) *Nature of the road*	
Flat road	1
Gentile incline	2
Steep incline	3
Hump	4
Dip	5
Not stated	9
(*iii*) *Type of junction* :	
Y—junction	1
T—junction	2
Four arm junction	3
Staggered junction	4
Junction with more than 4 arms	5
Rotary junction	6
Rail crossing	7
Not stated	9

8.2 Type of surface:

	Code No.
Concrete	1
Bituminous or Black topped	2
Metalled or gravel road	3
Earth or Kutch road	4
Other type of surface (specify)	5

8.3 Condition of surface:

(*i*)	Dry	1
	Wet	2
(*ii*)	Good surface	1
	Loose surface	2
	Rutted and/or pot holed	3
	Road under repairs/construction	4
	Corrugated or wavy road	5
	Slippery surface	6
	Snowy	7
	Muddy	8
	Oily	9

9. Road features

(*a*)	(*i*) One lane road without pucca shoulder (upto 5.5 m)	1
	(*ii*) One lane road with pucca shoulder (upto 5.5 m)	2
(*b*)	Two lane carriageway without cycle track (5.5 m—7.25 m)	3
(*c*)	Two lane carriageway with cycle track (7.25 m.—9.0 m.)	4
(*d*)	Undivided four lane carriageway without cycle track (9.0m—12.25m)	5
(*e*)	Undivided four lane carriageway with cycle track (12.25 m—15.25 m)	6
(*f*)	Dual carriageway without cycle track (12.25m—14.5 m)	7
(*g*)	Dual carriageway with cycle track (13.50 m—18.25 m)	8
(*h*)	Not stated	9

10. Traffic conditions:

(*i*) Traffic density

	Code No.
Heavy traffic	1
Medium traffic	2
Light traffic	3
Not stated	9

(*ii*) Nature of traffic

	Code No.
Mixed—fast and slow	1
Slow traffic segregated from fast	2
Only fast	3

(*iii*) Type of traffic control

	Code No.
Light controlled	1
Police controlled	2
Stop sign	3
Flashing signal	4
Uncontrolled	5

(*iv*) Traffic regulations

	Code No.
One-way street	1
Entry of heavy vehicles prohibited	2
Entry of slow moving vehicles prohibited	3
Speed restrictions	4
Parking prohibited	5
Any other	6

12. Details of drivers of vehicles involved

(*i*) *Name and address of the driver(s)*

Vehicle 1

Vehicle 2

Vehicle 3

(*ii*) *Vehicles driven by*	Code No.	Veh. 1	Veh. 2	Veh. 3
Owner of private vehicle . .	1			
Owner of public commercial vehicle .	2			
Paid driver	3			
Others	4			
(*iii*) *Sex of driver*				
Male	1			
Female	2			

(*iv*) *Age of driver* (*specify also*)	Code No.	Veh. 1	Veh. 2	Veh. 3
Age				
Under 18 years	1			
18 and 19 years	2			
20—29 years	3			
30—39 years	4			
40—49 years	5			
50—59 years	6			
60—69 years	7			
70—and above	8			
Not stated	9			

(*v*) *Driving experience*	Code No.	Veh. 1	Veh. 2	Veh. 3
Number of years				
Less than 1 year	1			
1—2 years	2			
2—3 years	3			
3—4 years	4			
4—5 years	5			
5—10 years	6			
10—15 years	7			
Above 15 years . . .	8			
Not stated	9			
(*vi*) *Type of licence*				
Regular licence	1			
Learner's licence	2			
Without licence	3			

	Code No.	Veh. 1	Veh. 2	Veh. 3
(*vii*) *Licence number and details*				
Number				
Date of issue				
Date of expiry				
Place of issue				
(*viii*) *Educational level*				
Illiterate	1			
Literate	2			
High School	3			
College	4			
(*ix*) *Number of convictions*				
Involved for the first time	1			
Previously involved but not convicted	2			
Previously involved and convicted	3			
(*x*) *Type of Manoeuvre*				
Diverging	01			
Merging	02			
Stationery	03			
Temporarily held up	04			
Parked	05			
Stopping	06			
Starting from near side	07			
Starting from off side	08			
Turning right	09			
Turning left	10			
Making U turn	11			
Going ahead, overtaking	12			
Going ahead, not overtaking	13			
Using private entrance	14			
(*xi*) *Responsibility of driver*				
(*a*) Intoxicated or drugged	01			
(*b*) Exceeded lawful speed	02			
(*c*) Did not give right to way to vehicle	03			
(*d*) Did not give right of way to pedestrian	04			

	Code No.	Veh. 1	Veh. 2	Veh. 3
(*e*) Followed too closely	05			
(*f*) Passed on hill	06			
(*g*) Passed on curve	07			
(*h*) Cut in sharply after passing	08			
(*i*) Other improper passing	09			
(*j*) On wrong side of road not in passing	10			
(*k*) Failed to give signal or gave improper signal	11			
(*l*) Improper turn-wide on the side lane	12			
(*m*) Improper turn-cut corner on outside lane	13			
(*n*) Improper turn-from wrong lane	14			
(*o*) Other improper turning	15			
(*p*) Disregarded Police Officer	16			
(*q*) Disregarded traffic Signals	17			
(*r*) Disregarded flashing light	18			
(*s*) Disregarded stop sign	19			
(*t*) Disregarded warning sign	20			
(*u*) Improper starting from parked position	21			
(*v*) Improper parking location	22			
(*w*) Asleep or fatigued or sick	23			
(*x*) Inattentive or attention diverted at the moment	24			
(*y*) Improper use of headlights causing glare	25			
(*z*) Other improper action (describe)	26			
13. **Particulars of vehicles involved** :				
(*i*) *Age of vehicle* :				
Upto 1 year	1			
1—2 Years	2			
2—4 years	3			
4—6 years	4			
6—8 years	5			
8—10 years	6			
More than 10 years	7			
Not stated	9			

	Code No.	Veh. 1	Veh. 2	Veh. 3
(*ii*) *Other particulars of vehicles*:				
(*a*) Load				
(*i*) Overloaded	1			
(*ii*) Load protruding	2			
(*b*) Left hand drive	1			
(*c*) Vehicular defects				
(*i*) Defective brakes	1			
(*ii*) Defective steering	2			
(*iii*) Punctured or burst	3			
(*iv*) Bald tyre	4			
(*v*) Other serious mechanical defect (describe)	5			
(*iii*) *Certificate of fitness in the case of commercial vehicles only Certificate of fitness*:				
(*i*) In force	1			
(*ii*) Not in force (expired)	2			
(*iv*) *Insurance*				
(*a*) Name of Insurance Company	1			
(*b*) Type of insurance	2			
Comprehensive	3			
Third party				
Not insured				

14. **Details of pedestrian or person other than the driver involved.**

	Code/Person/Pedestrian No.				
(*i*) *Age of person/pedestrian*					
Under 5 years	1	1	2	3	4
5—14 years	2				
15—24 years	3				
25—34 years	4				
35—44 years	5				
45—54 years	6				
55—64 years	7				
65 and above	8				
Not stated	9				

	Code No.	Veh. 1	Veh. 2	Veh. 3
(ii) Other details of person/pedestrian				
(1) Intoxicated or drugged	01			
(2) School child or not	02			
(3) Pedestrian deaf, blind or otherwise infirm	03			
(4) Crossing at intersection-with signal	04			
(5) Crossing at intersection-against signal	05			
(6) Crossing at intersection-no signal	06			
(7) Crossing at intersection-diagonally	07			
(8) Crossing at pedestrian crossing	08			
(9) Crossing not at intersection or pedestrian crossing	09			
(10) Coming from behind parked vehicle	10			
(11) Walking in roadway—with traffic, side-walks not available	11			
(12) Walking in road-with traffic, side-walks available	12			
(13) Walking in roadway—against traffic, side-walks not available	13			
(14) Walking in roadway—against traffic, side—walks available	14			
(15) Pushing or working on vehicle	15			
(16) Other working on carriageway	16			
(17) Playing on roadway	17			
(18) Hitching on vehicle	18			
(19) Sleeping or squatting on the road	19			
(20) Dismounting or mounting stationary vehicle	20			
(21) Dismounting or mounting moving vehicle	21			
(22) Not on roadway (explain)	22			
(23) Other actions (specify)	23			

15. Details of cyclists involved	Code No.
(1) Double riding	01
(2) Not keeping to the left	02
(3) Without light at night	03
(4) Going on carriageway—cycle track available	04

(5) Going on carriageway—cycle track not available	05
(6) Cycling in the lane of fast moving vehicles	06
(7) Cutting in the flow of traffic or zigzag moving	07
(8) Turning right carelessly/without giving signal	08
(9) Towing himself with other vehicle .	09
(10) Not observing traffic rules . . .	10
(11) Confused by traffic	11
(12) Rider inexperienced	12
(13) Loss of control	13
(14) Skidding on wet/slippery road . .	14
(15) Others (specify)	15

16. (i) Type of persons killed or injured	Code No.	Killed		Injured			
		Male	Female	Grievously		Slightly	
				Male	Female	Male	Female
(1) Pedestrians . .	1						
(2) Drivers and passengers of bicycles or tricycles without auxiliary engine . .	2						
(3) Drivers and passengers of motor cycles or motor bicycles .	3						
(4) Drivers and passengers of Mechanically propelled road vehicles other than cycles and motor cycles .	4						
(5) Drivers and passengers of animal drawn vehicles	5						
(6) Riders of horses or other animals .	6						
(7) Pullers of rickshaws or handcarts . .	7						
(8) Other persons . .	8						

(ii) Animals	Killed	Injured

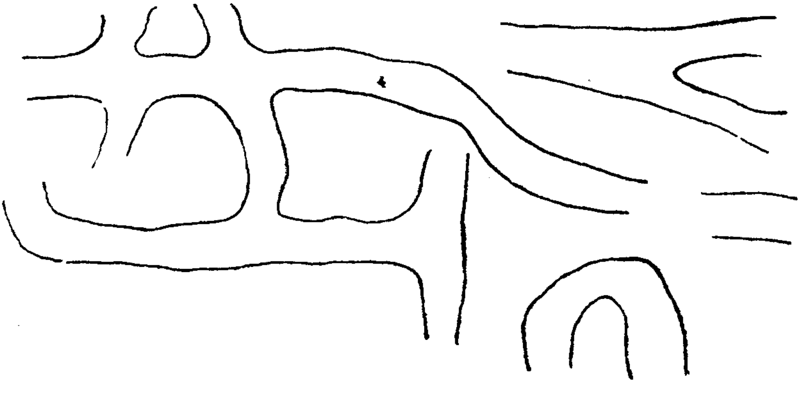
17. (i) Damage to vehicle involved (in Rs.)

Damage in rupees	Code No.
upto 100	1
100—300	2
300—500	3
500—700	4
700—1000	5
1000—1500	6
1500—2000	7
Above 2000	8
Not stated	9

(ii) Damage to other property (to be specified by type and in Rupees)

Damage to other property in Rs.	Code No.
Upto 100	1
100—300	2
300—500	3
500—700	4
700—1000	5
1000—1500	6
1500—2000	7
Above 2000	8
Not stated	9

18. Diagrammatic sketch of accident site and brief description of the accident (given below are mere examples)



19. Names of persons (with user's classification pedestrian, driver, etc.). Addresses

Killed

Grievously injured

Slightly injured

Witness

20. Result of investigation and court proceedings.

ANNEXURE 14

PROPOSED ROAD ACCIDENT FORM-4

Statement containing particulars of road accidents in the state of....... for the year ending December....................................

I. Total number of accidents classified according to month of the year.

Month	Accidents				
	Fatal	Grievous injury	Minor injury	Non-injury	Total
1. January					
2. February					
3. March					
4. April					
5. May					
6. June					
7. July					
8. August					
9. September					
10. October					
11. November					
12. December					
TOTAL					

II. Accidents classified according to type of vehicles and objects involved:—

Type of vehicle/object	Primary vehicle					Secondary vehicle				
	Accidents					Accidents				
	Fatal	Grievous injury	Minor injury	Non injury	Total	Grievous injury	Fatal	Minor injury	Non injury	Total
1. Motor cycle solo without pillion										
2. Motor cycle sole with pillion										
3. Motor cycle with side car .										
4. Motor car without trailer .										
5. Motor car with trailer .										
6. Auto-rickshaw . . .										
7. Jeep										
8. Motor cab (taxi) . .										
9. Omnibus (Non-articulated)										
10. Omnibus (Articulated) .										
11. Other Public Service vehicle										
12. Goods vehicle without trailer										
13. Goods vehicle with trailer .										
14. Articulated goods vehicle .										
15. Tractor										
16. Other motor vehicles (including road rollers) . .										
17. Tram car . . .										
18. Cycle										
19. Cycle-rickshaw or other form of pedal tricycle .										
20. Rickshaw other than tricycle rickshaw or hand-cart										
21. Hand drawn vehicle . .										
22. Bullock cart or other animal drawn vehicle . . .										
23. Class of vehicle not known										
24. Pedestrian . . .										
25. Animals (ridden) . .										
26. Animals (loose) . .										
27. Tree										
28. Train at unguarded level crossing										
29. Level crossing gate . .										
30. Other fixed object . .										
31. Not stated . . .										
TOTAL .										

III. Accidents classified according to cause :—

Cause of accident	Accidents				
	Fatal	Grievous injury	Minor injury	Non-injury	Total
1. Fault of driver of motor vehicle					
2. Fault of driver of vehicle other than a motor vehicle.					
3. Fault of cyclist . .					
4. Fault of pedestrian . .					
5. Fault of passenger . .					
6. Defect in mechanical condition of motor vehicle .					
7. Defect in light condition .					
8. Defect in road condition .					
9. Result of weather conditions (e.g. mist, fog, heavy rains, hail, strong wind, dust storm, etc.). . . .					
10. Other cause . . .					
11. Cause not known . .					
TOTAL .					

IV. Accidents classified according to location.

(a) Classification of road

Classification of road	Accidents				
	Fatal	Grievous injury	Minor injury	Non-injury	Total
1. National Highway					
2. State Highway					
3. District Road					
4. Village Road					
5. Municipal Road					
6. Not stated					
Total :					

(b) Type of area

Area	Accidents				
	Fatal	Grievous injury	Minor injury	Non-injury	Total
1. Near school or college					
2. Near or inside a village . . .					
3. Near a factory/industrial area .					
4. Near a religious place . . .					
5. Near a recreation place/cinema .					
6. In bazar					
7. Near Office complex . . .					
8. Near hospital					
9. Other built-up area . . .					
10. Unbuilt-up area					
Total :					

V. Accidents classified according to type of collision

Nature of accident	Accidents				
	Fatal	Grievous injury	Minor injury	Non-injury	Total
1. Overturning					
2. Head-on collision					
3. Rear-end collision					
4. Collision brush/sidewipe . . .					
5. Right angled collision . . .					
6. Skidding					
7. Right-turn collision					
8. Others					
9. Not stated					
Total :					

VI. Accidents classified according to light conditions :

Light conditions	Accidents				
	Fatal	Grievous injury	Minor injury	Non-injury	Total
1. Day light					
2. Twilight					
3. Dark with good street light . .					
4. Dark with poor street light . .					
5. Dark with no street light . . .					
6. Not stated					
Total :					

VII. Accidents classified according to weather conditions :

Weather conditions	Accidents				
	Fatal	Grievous injury	Minor injury	Non-injury	Total
1. Fine					
2. Mist					
3. Fog					
4. Cloudy					
5. Light rain					
6. Heavy rain					
7. Hail					
8. Sleet or snow					
9. Strong wind					
10. Dust storm					
11. Very hot					
12. Very cold					
13. Other extra ordinary weather conditions					
14. Not stated					
Total :					

VIII. Accidents classified according to road conditions :

(a) (i) *Geometry of the road*	Accidents				
	Fatal	Grievous injury	Minor injury	Non-injury	Toal
1. Straight road					
2. Slight curve					
3. Sharp curve					
4. Intersection					
5. Not stated					
Total					
(a) (ii) *Type of junction*					
(i) Y-junction					
(ii) Tejunction					
(iii) Four arm junction . . .					
(iv) Staggered Junction . . .					
(v) Junction with more than 4 arms					
(vi) Rotary Junction . . .					
(vii) Rail Crossing					
(viii) Not stated					
Total					

(*b*) *Nature of the road*

Type of surface	Accidents				
	Fatal	Grievous injury	Minor injury	Non-injury	Total
1. Concrete					
2. Bituminous or black topped . .					
3. Metalled or gravel road . . .					
4. Earth or kutcha road . . .					
5. Other type of surface . . .					
6. Not stated					
Total :					

(*c*) *Nature of the road*	Accidents				
	Fatal	Grievous injury	Minor injury	Non-injury	Total
1. Flat road					
2. Gentle incline					
3. Steep incline					
4. Hump					
5. Dip					
6. Not stated					
Total					

(*d*)(*i*) *Condition of Surface*

Condition of surface	Accidents				
	Fatal	Grievous injury	Minor injury	Non-injury	Total
(1) Dry					
(2) Wet					
(3) Not stated					
Total					

(*d*)(*ii*) 1. Good surface					
2. Loose surface					
3. Rutted and/or pot holed.					
4. Road under repairs/construction					
5. Corrugated or wavy road					
6. Slipper surface					
7. Snowy					
8. Muddy					
9. Oily					
10. Not stated.					
Total					

IX. Accidents classified according to road features :

Road features	Accidents				
	Fatal	Grievous injury	Minor injury	Non-injury	Total
(a) (*i*) One lane road without pucca shoulder (up to 5.5 m.)					
(ii) One lane road with pucca shoulder (up to 5.5 m.)					
(b) Two lane carriageway without cycle track (5.5 m.—7.25 m.)					
(c) Two lane carriageway with cycle track (7.25 m.—9.0 m.)					
(d) Undivided four lane carriageway without cycle track (9.0 m.—12.25 m.)					
(e) Undivided four lane carriageway with cycle track (12.25 m.—15.25 m.)					
(f) Dual Carriageway without cycle track (12.25 m.—14.5 m.)					
(g) Dual carriageway with cycle track(13.50 m.—18.25 m.)					
(h) Not stated					
Total					

X. Accidents classified according to traffic accidents :

(*i*) *Traffic density*

Traffic Density	Accidents				
	Fatal	Grievous injury	Minor injury	Non-injury	Total
1. Heavy traffic					
2. Medium traffic					
3. Light traffic					
4. Not stated					
Total					

X. (*ii*)

Nature of Traffic	Accidents				
	Fatal	Grievous injury	Minor injury	Non-injury	Total
1. Mixed—fast and slow . . .					
2. Slow traffic segregated from fast .					
3. Only fast.					
Total					

(*iii*) Type of traffic control	Accidents				
	Fatal	Grievous injury	Minor injury	Non-injury	Total
1. Light controlled.					
2. Police controlled					
3. Stop sign					
4. Flashing signal					
5. Uncontrolled					
6. Not stated					
Total					

XI. Accidents classified according to details of drivers of vehicles involved :

(*a*) *Vehicles driven by :*

Vehicle driven by	Primary vehicle					Secondary vehicle				
	Accidents					Accidents				
	Fatal	Grievous injury.	Minor injury.	Non-injury	TOTAL	Fatal	G. injury	Minor injury	Non. injury	TOTAL
1. Owner of private vehicle										
2. Owner of public/commercial vehicle .										
3. Paid driver . .										
4. Other . .										
Total . . .										

(b) Sex of drivers

1. Male . . . .
2. Female . . .

Total . . . .

(c) Age of drivers

1. Under 18 years . .
2. 18 and 19 years . .
3. 20—29 years . . .
4. 30—39 years . . .
5. 40—49 years . . .
6. 50—59 years . . .
7. 60—69 years . . .
8. 70 and above . . .
9. Not stated . . .

Total . . .

(d) Driving experience	Primary vehicle					Secondary vehicle				
	Accidents					Accidents				
Number of years	Fatal	Grievous inj.	Minor inj.	Non-inj.	Total	Fatal	G.-inj.	M.-inj.	Non.-inj.	Total
1. Less than 1 year										
2. 1—2 years. .										
3. 2—3 years. .										
4. 3—4 years. .										
5. 4—5 years. .										
6. 5—10 years .										
7. 10—15 years .										
8. Above 15 years										
9. Not stated .										
Total .										

(e) Type of licence

Type of licence

1. Regular licence . . .
2. Learner's licence . .
3. Without licence . .
4. Not stated . . .

Total . . . .

(f) Educational level

Educational level

1. Illiterate
2. Literate
3. High School
4. College
5. Not stated

Total

(g) Number of convictions

Number of convictions

1. Involved for the first time
2. Previously involved but not convicted
3. Previously involved and convicted
4. Not stated

Total

(h) Manoeuvre :

Type of Manoeuvre :

1. Diverging
2. Merging
3. Stationery
4. Temporarily held up
5. Parked
6. Stopping
7. Starting from near side
8. Starting from off side
9. Turning right
10. Turning left
11. Making U turn
12. Going ahead, overtaking
13. Going ahead, not overtaking
14. Using private entrance
15. Not stated

Total

XI. Responsibility of driver

Responsibility of driver	Primary vehicle					Secondary vehicle				
	Accidents					Accidents				
	Fatal	Grievous inj.	Minor inj.	Non-inj.	Total	Fatal	Grievous inj.	Minor inj.	Non inj.	Total
1. Introxicated or drugged .										
2. Exceeded lawful speed .										
3. Did not give right of way to vehicle										
4. Did not give right of way to pedestrian . . .										
5. Followed too closely .										
6. Passed on hill . . .										
7. Passed on curve . .										
8. Cut in sharply after passing										
9. Other improper passing										
10. On wrong side of the road not in passing . . .										
11. Failed to give signal or gave improper signal . .										
12. Improper turn-wide on side lane										
13. Improper turn-cut corner on out-side lane. . . .										
14. Improper turn from wrong lane										
15. Other improper turning .										
16. Disregarded Police Officer .										
17. Disregarded traffic signals										
18. Disregarded flashing light										
19. Disregarded stop sign .										
20. Disregarded warning sign.										
21. Improper starting from parked position . .										
22. Improper parking location										
23. Asleep or fatigued or sick										
24. Inattentive or attention diverted at the moment .										
25. Improper use of head lights causing glare . . .										
26. Other improper actions .										
27. Not stated . . .										
Total										

XII. Accidents classified according to the particulars of vehicles involved :

(i) Age of vehicle

	Primary vehicle					Secondary vehicle				
	Accidents					Accidents				
	Fatal	G. Injury	Minor Injury	Non-Injury	Total	Fatal	G. Injury	Minor Injury	Non-Injury	Total
Age										
1. Upto 1 year										
2. 1—2 years										
3. 2—4 years										
4. 4—6 years										
5. 6—8 years										
6. 8—10 years										
7. More than 10 years										
8. Not stated										
Total										
(ii) Other particulars of vehicles.										
Load										
(a) (i) Overloaded										
(ii) Load protruding										
(b) Left hand drive										
(c) Vehicular defect										
(i) Defective brakes										
(ii) Defective steering										
(iii) Punctured or burst										
(iv) Bald tyre										
(v) Other serious mechanical defect										

(iii) Certificate of fitness in case of commercial vehicle only :

	Primary vehicle					Secondary vehicle				
Certificate of Fitness	F.	G. inj.	Minor inj.	Non-inj.	Total	F.	G. inj.	Minor inj.	Non-inj.	Total
1. In force										
2. Not in force (expired)										
3. Not stated										
Total										

XIII. Accidents classified according to details of pedestrian or any other person involved.

(i) *Age of pedestrian/other person killed or injured.*

Age	No. of persons			
	Killed	Grievously injured	Slightly injured	Total
1. Under 5 years				
2. 5—14 years				
3. 15—24 years				
4. 25—34 years				
5. 35—44 years				
6. 45—54 years				
7. 55—64 years				
8. 65 and above				
9. Not stated				
Total				

(ii) *Other details of persons/pedestrian*

Other details
1. Intoxicated or drugged
2. School child or not
3. Pedestrian deaf, blind or otherwise infirm
4. Crossing at intersection—with signal
5. Crossing at intersection—against signal
6. Crossing at intersection—no signal
7. Crossing at intersection—diagonally
8. Crossing at pedestrian crossing
9. Crossing not at intersection or pedestrian crossing
10. Coming from behind parked vehicle
11. Walking in roadway with traffic, side-walks available
12. Walking in roadway—against traffic, side-walks available.
13. Walking in roadway—with traffic, side-walks not available.
14. Walking in roadway—against traffic, side-walks not available

Other details	No. of persons			
	Killed	Grievously injured.	Slightly injured.	Total
15. Pushing or working on vehicle .				
16. Other working on carriageway .				
17. Playing on roadway . .				
18. Hitching on vehicle . . .				
19. Sleeping or squatting on the road .				
20. Dismounting or mounting stationery vehicle				
21. Dismounting or mounting moving vehicle				
22. Not on roadway				
23. Other actions				
24. Not stated.				

XIV. Accidents classified according to details of cyclists involved.

Details of cyclists	Accidents				
	Fatal	Grievous injury	Minor injury	Non-injury	Total
1. Double riding					
2. Not keeping to the left . . .					
3. without light at night . . .					
4. Going on carriageway—cycle track available					
5. Going on carriageway—cycle track not available					
6. Cycling in the lane of fast moving vehicles					
7. Cutting in the flow of traffic or zigzag moving					
8. Turning right carelessly/without giving signal					
9. Towing himself with other vehicle .					
10. Not observing traffic rules . .					
11. Confused by traffic					
12. Rider inexperienced					
13. Loss of control . . .					
14. Skidding on wet/slippery road .					
15. Others					
16. Not stated					
Total					

XV. Accidents classified according to type of persons and animals killed or injured.

(*i*) *Type of persons killed or injured.*

Type of person	No. of persons		
	Killed	injured	
	Male/ Female	Grievously	Slightly
		Male/ Famale	Male/ Female
1. Pedestrians			
2. Drivers and passengers of bicycles or tricycles without auxiliary engine . .			
3. Drivers and passengers of motor cycles or motor bicycles.			
4. Drivers and passengers of mechanically propelled road vehicles other than cycles and motor cycles			
5. Drivers and passengers of animal drawn vehicles			
6. Riders of horses or other animals .			
7. Pullers of rickshaws or handcarts			
8. Others persons			
9. Not stated			
Total			

(ii) *Animals*	Killed	Injured	Total

XVI. Accidents classified according to damage to vehicles and other property (in Rs.)

(i) *Damage to vehicles involved (in Rs.)*

	Primary Vehicle					Secondary Vehicle				
	F.	Grievous inj.	Minor inj.	Non-inj.	Total	F.	G. inj.	Minor inj.	Non-inj.	Total
1. Upto 100 . .										
2. 100—300 .										
3. 300—500 .										
4. 500—700 . .										
5. 700—1000 .										
6. 1000—1500 .										
7. 1500—2000 .										
8. Above 2000 .										
9. Not stated .										
Total .										

(ii) *Damage to other property (in Rs.)*

	Accidents				
	Fatal	Grievous injury	Minor injury	Non-injury	Total
1. Upto 100					
2. 100—300					
3. 300—500					
4. 500—700					
5. 700—1000					
6. 1000—1500					
7. 1500—2000					
8. Above 2000					
9. Not stated					
Total					

ANNEXURE 15

NATIONAL ROAD SAFETY COUNCIL

(A draft scheme for India)*

CONSTITUTION AND OBJECTS OF THE NATIONAL ROAD SAFETY COUNCIL

I. Principles:

The National Road Safety Council shall be a non-commercial, non-profit making and non-political organisation. It shall be registered under the Societies Registration Act, 1860.

II. Objects & Purpose:

The objects and purpose of the Council shall be:—

(1) To collect, analyse and interpret statistics of road accidents in the country.

(2) To undertake special studies of accidents and their causes, accident-prone areas including rail-road crossings, promote and/or conduct research on all aspects of road safety and suggest and publicise measures to reduce accidents.

(3) To carry out nationl safety check-ups or surveys of motor vehicles independently or in conjunction with other institutions or organisations.

(4) To assist in the development of vehicle testing stations with a view to eliminating the use of defective vehicles.

(5) To suggest amendment to the existing law or promotion of new legislation for the purpose of road safety.

(6) To develop methods for achieving time or space segregation between mechanically propelled vehicles and manual or animal drawn vehicles.

(7) To suggest (a) traffic signals, road markings and sign-boards for display on roads for the guidance of drivers and other road users and (b) other measures for the effective enforcement of the traffic regulations.

(8) To educate road users and drivers of all classes of vehicles in road safety through press, journals, pamphlets, handouts, posters etc. and other methods, e.g. broadcasts, films, slides and other audio-visual devices.

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*Prepared by the Ministry of Shipping & Transport (Transport Wing).

(9) To collect, publish, distribute an disseminate educational and informative data or literature regarding safety methods and procedures.

(10) To publish a newspaper, journal or other literature for the furtherance of the objects of the Council.

(11) To organise lectures and arrange conferences and seminars on road safety for the exchange of ideas, experience and information on road safety and accident prevention.

(12) To stimulate greater public interest, support for and active participation in road accident prevention.

(13) To set up libraries, museums, road side shelters, exhibitions etc. with models, maps, posters, charts and other illustrated and descriptive publications on road traffic and safe driving.

(14) To draw up specific programmes and lay down syllabus for the education of school children in road safety.

(15) To draw up specific programmes for the safety of pedestrians, such as provision of special facilities such as sub-ways, special signals etc.

(16) To draw up specific programmes for the safety of cyclists, such as cycleways, special signals, driving tests etc.

(17) To prepare schemes for the training of drivers in safe driving.

(18) To prepare schemes and syllabus for the training of officers responsible for the control of traffic on road and of the instructors.

(19) To recommend the measures necessary to bring motor training schools upto a desired standard and to prepare the syllabus for training.

(20) To organise safety driving competitions and "Road Safety" Weeks and provide incentives for safe driving.

(21) To co-operate with, enlist, and develop the co-operation of, and between all persons and other organisations and agencies, both public and private, engaged or interested in, or in any way connected with, any or all of the foregoing purposes (e.g. organise exhibitions on road safety, run institutions for imparting training).

(22) To administer any special funds which are entrusted to it for any specific purpose.

(23) To do all other acts which are conducive to one or more of the above objects.

III. Membership:

The membership of the Council shall be open to all persons and organisations who are interested in road safety and agree with the Council's principles, as given in Article I. The annual membership fee shall be Rs. 25 for an individual and Rs. 300 for an orgaisation.

IV. Finance :

Funds for the operation of the Council shall be secured as follows:—

(a) Membership fees.

(b) Voluntary contributions from individuals, business organisations and other institutions.

(c) Any regular or *ad hoc* grants made by the Central and State Governments, Municipal Corporations and other local bodies.

(d) Sale proceeds of literature published by the Council.

(e) Proceeds of special tickets or flags issued during the observance of "Safety Weeks" etc., by the Council.

(f) Interest on the investment, if any, of the Council's funds.

(g) Any other funds entrusted to it for general or specific purposes connected with the objects of the Council.

V. Organisation :

The Council shall have a Governing Body comprised as follows:—

(i) Two representatives of the Union Ministry of Transport and Communication (Department of Transport).

(ii) One representative each of the Union Ministries of (a) Education, (b) Scientific Research and Cultural Affairs, (c) Steel and Heavy Industries, (d) Finance, (e) Defence, (f) Mines and Fuel, and (g) Railways.

(iii) The Controller of Insurance or his nominee.

(iv) One representative of each State Government.

(v) Four representatives from the Union Territories who will be taken by rotation.

(vi) Not more than ten specialists nominated by the Central Government (three each for traffic regulation, traffic engineering and transport operation), at least, one each being from the cities of Calcutta, Bombay, Delhi and Madras.

(vii) Any member or a representative of any member who donates an appreciable sum (say 3 to 5 lakhs) to Council without any restriction on the use of the money for the furtherance of the objects of the Council.

(viii) Not more than three representatives of the State Road transport Undertakings.

(ix) Not more than five representatives of the private road transport undertakings and unions/associations of road transport operators.

(x) Not more than six representatives of the existing road safety organisations, automobile associations and institutions/organisations connected with road transport, development and research.

(xi) Not more than two representatives of the firms engaged in the manufacture or sale of automobiles.

(xii) Not more than three representatives, one each from firms engaged in (a) manufacturing and/or selling tyres, (b) selling spare parts and (c) manufacturing and/or selling oils, lubricants etc.

(xiii) Not more than 2 representatives of insurers.

(xiv) Five persons elected from the individual members not covered by any of the above categories, provided that one additional member may be elected for every 100 members, beyond 500, subject to the condition that the maximum number of persons elected under this clause shall not exceed 10.

Members of the Governing Body falling under (viii) to (xiv) will be elected out of and by the Members of the Council. Each member will have only one vote and shall, for the purpose of election, declare to which of the above categories (viii to xiv) he belongs, and his vote will be limited to the election of a representative from that category. For instance, insurance companies, who are members of the Council, will from the electorate for electing two insurers to the Governing Body; similarly, motor transport operators will constitute the electorate for electing five representatives from among themselves, and they will not be eligible for further elections outside their groups.

The total number of members of the Governing Body shall not be less than 40. Each member will be nominated/elected for a period of two years. A member, who donates a prescribed amount, say Rs.3 to 5 lakhs, shall be entitled to permanent representation in the Governing Body. The Governing Body shall meet at least once a year. The quorum for a meeting of the Governing Body shall be 20.

An Executive Committee consisting of fourteen persons chosen from among its members shall be appointed by the Governing Body; three of these members will be representatives of the Central Government and four of the State Governments. The Vice Chairman of the Council shall be the Chairman of the Executive Committee. The quorum for a meeting of the Executive Committee shall be 5. The Executive Committee will be responsible for the day-to-day work of the Council and it shall meet as often as business may require. All questions coming before a meeting of the Executive Committee shall be decided by a majority of the votes of the members present and voting. In the case of an equality of votes, the Chairman of the Executive Committee shall have a casting vote. Whenever, it is not possible for the Executive Committee to meet formally, matters may be transacted by circulation of papers. However, no resolution shall be deemed to have been duly passed by the Committee, unless the resolution has been circulated, in draft, together with the necessary papers, if any, to all the members, and has been approved by a majority of them.

No T.A. or D.A. will be paid for attending meetings of the Governing Body. The Executive Committee will, however, frame its own regulations for payment of T.A. and D.A. for attending its meetings.

VI. Sub-Committees:

The Executive Committee may appoint the following Sub-Committees for the efficient conduct of its business and achievement of its objects and purpose:

(1) Accident Research Sub-Committee.

(2) Traffic Control and Enforcement Sub-Committee.

(3) Traffic Engineering Sub-Committee.

(4) Statistical Sub-Committee.
(5) Third Party Insurance Sub-Committee.
(6) Finance Sub-Committee.
(7) Publicity and Safety Literature Sub-Committee.
(8) Safety Driving Competitions Sub-Committee.
(9) Education Sub-Committee.
(10) Any other Committee that may be necessary.

The convenor of each of the Sub-Committees shall be one of the members of the Executive Committee, nominated by the Chairman of the Executive Committee. Individuals, who are specailists in the relevant fields, may be included in the sub-committees even if they are not members of the Council.

VII. State and Local Road Safety Organisations;

(1) The National Road Safety Council shall set up State and Local Road Safety Organisations for carrying on or promoting the objects of the Council.

(2) The State and Local Road Safety Organisations shall carry out road safety programmes in accordance with the policy, and under the direction of the National Body.

(3) Local Road Safety Organisations may be given financial assistance by the Central Body.

VIII. Headquarters:

The headquarters of the National Road Safety Council will be at New Delhi.

IX. Chairman, Vice-Chairman, Treasurer & Secretary:

The Chairman , Vice-Chairman, Treasurer and Secretary of the Council shall be appointed by the Government of India. The Chairman shall preside over the general meetings of the Council and also meeting of the Governing Body. In the absence of the Chairman, the Vice-Chairman shall preside over a meeting.

The Secretary shall be a whole-time employee of the Council. He shall maintain a record of the general meetings of the Council and the meetings of the Governing Body. He shall also be in charge of the day-to-day administrative work in the headquarters office of the Council and will be answerable to the Executive Committee of the Governing Body.

The Governing Body shall frame rules for the day-to-day conduct of its business and also for regulating its financial and other relationship with the State and local Road Safety Organisations set up under this Constitution.

APPENDIX 16

TRAFFIC WARDENS—A REVIEW*

The growth of traffic in Calcutta has given rise to pressing problems of safety and circulation on roads. It would be necessary to expand the educational, engineering and enforcement activities if we are to meet their challenge. The success of the official measures would, however, depend to a great extent on informed and active support of the citizens.

Order in any society largely depends upon the uniformity of behaviour by its members. The traffic laws lay down a code of conduct on the road, developed through experience over years. It is difficult to maintain compliance with the laws at a level consistent with public safety and convenience unless the enforcement measures are properly backed up by the citizens.

The Traffic wardens have been functioning since 1964. The organisation was sponsored with a view to securing organised support of the citizens in law enforcement and other activities of the Traffic Police. The primary objectives are:—

1. to conduct campaigns to inform the public about accident problems and the official programme; to encourage each citizen to accept his responsibility for his own and other safety;
2. to promote safety education for drivers, pedestrians and school children and to co-ordinate effects of interested agencies engaged in traffic safety education;
3. to co-operate with the public officials in building up sound programmes of accident prevention and traffic control;
4. to take part in the organised drives undertaken by Traffic Police from time to time.

It is purely a voluntary organisation, the members are usually chosen from representatives of Special Police Organisation, Home Guards and sponsored bodies, like Rotary Club, Automobile Association, Chambers of Commerce and in special cases from amongst respectable citizens of the city. After enrolment they are trained in techniques of traffic conrtol and law enforcement under specially trained coaches, in theory and practice. So far, we have 116 members in the organisation including a few ladies. Till to-day, the Traffic Wardens' Organisation in all important occasions have worked hand in hand with the Traffic Police in the city. During festive days and many other occasions the work of the organisation was really laudable.

To assist and guide the motorists, this orgnisation makes free distribution of special giude maps with detailed instructions of temporary measures to be adopted by the Traffic Police, such as, restrictions and parking arrangements, as advance information during national festivals, Test Cricket Matches, Special congregations etc.

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* A note sent by Shri P.G. Bhattacharjee, Deputy Commissioner of Police, Calcutta.

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The Children has been made a
success on account affic Police and the
Traffic Wardens' C set up to impart
visual education in es.

Apart from these s have been taking keen interest in enforcing traffic regulations and reporting information of serious traffic law violations which are committed beyond the view of the Police. Their task is also to correct, on the spot, erring motorists. They normally work in their localities and in their spare time.

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matters of road design and layout, engineering problems etc. observation of traffic control defects, existing or prevailing arrangements and offering suggestions for their improvement.

(ii) "Safety Education Cell" : Practicing and applying safety rules in traffic collaboration with the Safety First Association of India, training of School teachers, and children in safety matters to raise 'School Patrol' system to control traffic in the vicinity of Schools, where deployment of Traffic Police may not be possible.

(iii) "Special Co-ordination Cell" : To study the requirement of traffic rules and to prepare suggestions to be placed before the appropriate authority. Also to suggest selective enforcement programmes, if and when necessary.

Sylabus of Training of Traffic Wardens :

1. Knowledge of Motor Vehicles Act, Bengal Motor Vehicles and other related regulations.
2. Traffic offences-how to deal with.
3. Prosecution for rash and negligent driving, legal aspects, detection and practical procedure of institution of cases.
4. Road markings, different types of traffic signs.
5. Directing traffic, directing vehicle movement, technique of dealing with hold-up and congestion.
6. Accident causes, its prevention and action to be taken at the scene of accident.
7. Traffic Patrol, Patrol technique, pursuit driving, stopping and arpproaching the violator, location and identification of wanted vehicles.
8. Road Safety-Children's education and its utility.
9. Traffic Planning and its utility.
10. Practical training on roads.

DURATION OF TRAINING :

21 working days.

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